approach

SEPTEMBER 1977 THE NAVAL AVIATION SAFETY REVIEW


On

nights like this

By LCDR Tom Scully
VA-215

A BARREL roll to the left at 2000 feet, 270 KIAS, an F-4 on each wing and one in the slot.

Sound like an old *Blue Angel* maneuver? It's not. It's just a typical A-7 night tanker pilot doing his thing. They don't do it on purpose, mind you, but their hands are full, and sometimes even the best aviators will be fighting through a "bucket of worms" with this beast. They really try to fly smooth, but it's tough when they're being pushed, pulled, and lifted by the F-4s plugging them – not to mention the considerable asymmetric loading generated by the transfer of droptank fuel. It's a demanding mission, but you'd still think that flying as many tankers as they do, it would be a "milk run." Maybe that can be said about day tankers, but the truth is that you will never be too prepared for the challenge of the night tanker mission.

LT Hooty has the duty tanker for event 6 tonight, and as he puts on his flight gear, the haunting memory of last night's duty tanker sends a chill up his spine. He wishes that he could get hold of his detailer for just 1 minute for sending him to CVW-19 aboard the USS ROOSEVELT (old airplane, small ship, winter Med cruise, Naples liberty, and night tankers). While heading for the flight deck, he reflects back on what a unique air wing it is – west coast F-4s, A-7s, and E-1s, plus a Marine *Harrier* squadron. Having the F-4s requires a lot of tanker commitments, and the trusty old A-7B with its droptanks and D-704 "buddy store" got the job. But whoever named it the "buddy store" never had a friend.

With 10 minutes till launch, LT Hooty looks at the black emptiness all around him that only confirms what the weatherguesser said earlier – 3500-foot overcast and nasty. This might be a real "John Wayne'er." Taxiing past the other two A-7 tankers, he wonders if they've noticed the crowded tanker pattern overhead. As he approaches the cat, he's aware of the familiar feeling of apprehension for the coming launch. He remembers what the skipper said once, "If this was an easy business, everybody would be doing it" – a comforting thought only when you're sitting in the readyroom.

Any night cat shot is scary, but the tanker cat shot off a small deck is something else. The staggering force needed to get the tanker airborne leaves LT Hooty somewhat dazed as he's accelerated into the darkness. When his beast finally proves its willingness to fly, he sneaks out a quick "404, airborne," and then, as fearfully expected, he's told to join with tanker 301 at 3000 feet for a package check. (Doesn't that guy realize that sometimes you're not even cleaned up until 5000 feet, let alone safely airborne at night until above 10,000 feet?)

Things are really happening fast as he approaches the level off at 3000 feet, and while descending back to 3000 feet, he commences a very gentle left turn back to the ship. Headed inbound, he sees 301 overhead and sets up what appears to be a good rendezvous. Could he be so lucky as to be on a good bearing tonight? Whoops! A head-on pass. That sometimes happens on nights like this.

He finally gets together for the package check and curses softly as he digs for his flashlight. Invariably, the tanker control box is the only one with no lights, and he has to strain hard to see it back underneath his left arm. (Why do they always put the boxes you use all the time in the most out-of-the-way places?) 506 also joins the formation for a package check just as LT Hooty gets his drogue extended, the aircraft retrimmed, and starts climbing back to 3000 feet – smoother tanking is accomplished with ALT HOLD off, so altitude wanders a little. He flies as smoothly as possible now, because he realizes that 301 is probably sweating bullets while trying to get plugged in. It'll be his turn shortly, and he's well aware of the severe vertigo that the guy back there experiences. 301 goes slowly, but he does a good job of getting in. Very cautiously now, LT Hooty searches with his left hand for the TRANSFER switch, remembering that time when he selected DROGUE RETRACT instead and retracted the basket right off an F-4 probe. (Why did they put those switches so close together and so hard to get to?)

The package check is good, and when Tanker Control asks for his tanker status, he fights the urge to keep some extra gas for himself and says, "404 sweet, 6 to give." "Roger, 404, hawk the low state *Phantom* at 2 miles. If he bolters, he's yours for 2000 pounds." Control's response convinces him that it is not going to be an easy night.

LT Hooty descends away from the formation and turns hard toward the ship to try and be in the right position if the F-4 bolters – 2 o'clock high, 2000 feet, drogue extended, at 270 KIAS. Luck is on his side tonight as the F-4 safely traps aboard – not so fast. "404, got another

Phantom for you at 2 miles." (Do they understand the capabilities of a full tanker to do these three G 360's; not to mention the capabilities of the pilot on nights like this?) This F-4 bolters, so now he's got his work cut out for him. "201, this is 404 at 2000 feet, 20 degrees left bank, 270 knots." That pilot can use all the help he can get.

The F-4 joins as LT Hooty turns toward the bingo field, taking care to be extra smooth. He knows exactly how the F-4 pilot feels – tighter than a drum, frustrated with himself, and a little terrified. The F-4 plugs in smoothly, and as LT Hooty reports to Control that he's transferring fuel, he doublechecks all the transfer switches. The A-7 tanker is a fuel transfer nightmare – too many ways to screw up the offload transfer fuel. He strains again to see the fuel transfer counter with his flashlight while trying to figure out how many gallons there are in 2000 pounds. (Watch for the barrel roll.) Then Control tells him to drop the F-4 off at 6 miles downwind. (Right, where is downwind?) LT Hooty has all he can do just to keep his wings level – 2000 pounds of fuel moving from the right to the left wing leaves quite a trim change. Aviate, navigate, communicate, and transfer fuel is quite a load on nights like this.

No sooner has he finished with this F-4 than Control assigns him another one to hawk. As his luck would have it, the F-4 bolters, and he goes through the entire evolution all over again.

He's used up a lot of adrenalin tonight, but with the recovery complete, he finally gets a chance to relax a little. It won't be long until LT Hooty will be giving the oncoming tanker a package check, so now is the time to make sure his fuel is in the right tanks. He can't have any stuck in the droptanks. He needs to be able to transfer it to another aircraft if required, he has to be able to eat it himself, or he has to be able to dump it quickly – a transfer nightmare.

The oncoming tanker, 303, is airborne and should be rendezvousing shortly. LT Hooty breathes a sigh of relief that it will soon be in 303's hands for the next cycle. He even feels a little sympathetic for what 303 has ahead of him. Just then he notices 303 joining. It's a nice rendezvous bearing – for a head-on. He eventually gets together with 303, and just as he gets plugged in, Control calls and tells him to expedite the check. Some things can be hurried, but plugging at night is not one of them. Fighting severe vertigo, a turbulent basket, and a death grip on the stick, LT Hooty manages a lucky plug, but 303's package turns out to be inoperative. He is required by this turn of events to hawk the new pattern. But for once, luck is on his side – the F-4s get aboard, and another tanker is checked sweet. Relieved that he can now get himself mentally prepared for a landing, he takes a deep breath and switches to marshal frequency. No sooner does he check in with them than they say, "404, dump Charlie, turn right to 060 degrees, descend to angels 1.2, dirty up when level." (So much for being prepared – now what's the fastest way to get rid of this fuel?)

LT Hooty is approaching 5 miles on final before he gets a chance to complete his landing checklist – still dumping. The "buddy store" seems to be dumping much slower than normal, so he checks to make sure all of his switches are right. "Four miles," and the haunting feeling that the hose is still extended interrupts his concentration. He satisfies himself that it is retracted and then secures his dumps. "Two miles," and LT Hooty is still beating snakes out of the cockpit, trying to catch up. "404, three-quarters of a mile, below glide slope, call the ball." "Ball." When things are tight, that's all he can handle. Now remember, the tanker likes to decel in-close and settle at the ramp. There are a lot of "no-grade" one wires credited to this beast. Approaching in-close, he's getting a little behind the aircraft, and that hasn't happened since last night. "Power, power, power!" Bah, a one wire. Just a few more minutes, and this nightmare will be all over. As he clears the landing area with sweat in his eyes and knees like jelly, he hears a voice which puts the whole night in perspective – "404, lights on deck." That sometimes happens on nights like this.

Sitting in the wardroom an hour later, LT Hooty is having a glass of milk and a "PB and J" sandwich to calm himself down. He overhears a conversation at another table which has the intensity of any tales ever heard during the war. The stories are covering a whole different subject matter, however: near-misses in the tanker pattern; cases of vertigo while plugging; almost-completed barrel rolls with an F-4 plugged in; colorful rendezvous; tanks that wouldn't transfer; hoses that wouldn't cooperate; a full power climb to the one wire. He leans back and smiles, realizing that he was definitely not alone out there. It was a tough hop, and always will be.

Education is what you get from reading the fine print. Experience is what you get from *not* reading it.

Ace L.

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SOL (sweat out a landing)

SOMEWHERE in the cockpit briefing of multipiloted aircraft, the aircraft commander, if he's a pro, runs through the emergency procedures of what is to be done if a powerplant gets real sick right after takeoff. It makes no difference what kind of an aircraft it is. There are things to do which require coordination between pilots.

Despite this briefing, it sometimes becomes very difficult for pilots to do everything in a moment of high stress, and an accident occurs. Such was the case in this story.

It was just after 2230 one black night at the airfield of one of our sister services. The crew of a CH-53 was on a multileg, night cross-country. They had already refueled twice and were getting into position to take off on the last leg to their destination.

They became airborne from a grass parking area and were air taxiing to the duty runway. The copilot was flying the CH-53 and had picked up to about a 50-foot hover. All gages checked normally, and the copilot eased the helicopter laterally to avoid another helo parked in front of them. As he cleared the parked helo, he changed his direction slightly to proceed the remaining 400 feet to the runway. Just as he reached the runway, with the takeoff checklist completed, a loud explosion/bang was heard by all of the crew and some outside witnesses.

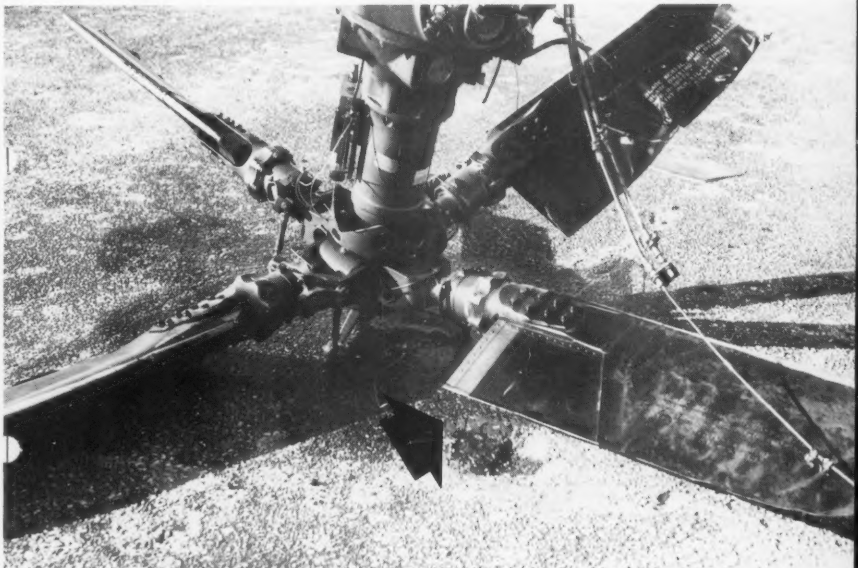
Immediately after the explosion, the aircraft yawed violently left, and there was a loss of rotor turns. The HAC told the copilot to get it on the ground. The collective was lowered, and a high sink rate developed. The copilot followed NATOPS for the emergency and put in forward cyclic to get some speed to make a run-on landing.

The HAC tried to reach the engine control levers but couldn't because his shoulder straps held him back. Simultaneously, both pilots recognized a high sink rate and grabbed the collective to arrest the descent. However, and this is a mystery not solved by the investigation, they were unable to raise the collective. They put enough force on the collective so that the pistol grip section of both collectives were broken off from the rest of the control. (One school of thought guessed that the collective was already full up, but others guessed that a mechanical malfunction occurred or that hydraulic pressure prevented movement.)

The helicopter was moving at an estimated speed of 10 knots when it hit nose-gear-first, shearing the gear. Then the lower left section of the airframe hit the runway, followed by a bounce back into the air, nose high. The next impact involved the tail rotor blades, tail skid, and rear cargo ramp. Finally, the helo hit for the last time, shearing the left main gear, rolled over to the left, and came to rest after the turning rotor head walked the aircraft around 160 degrees from its original heading. Fire ensued. It destroyed the cabin and gutted the cockpit. The four crewmen all received major injuries.

The No. 1 engine torque sensor shaft and housing had failed, preventing any power from the No. 1 engine to be transmitted to the main transmission. The No. 2 speed lever was found to be nearly completely off, which indicated that No. 2 engine was secured prior to final impact.

Few would argue that the pilots were *in extremis* from the moment of engine failure. Have you decided what your actions will be under *extremis* situations that offer little or no time to analyze the problem?



Arrow points to initial impact point where a hard landing in a nose-low attitude with a left drift caused nose gear to collapse. This spot was 90 feet from the main portion of the wreckage.

Every diamond has its flaw

By LCDR Bob Chenery
USS NIMITZ
(CVN-68)

THE last thing I saw was the twirly as the E-2 rolled by me and disappeared down a steep embankment at the end of the runway. Since it was night and there was water at the end of that embankment, I remember thinking to myself, "I wonder if I'll see the water splash."

This precarious situation had been set up by the *Hawkeye's* single-engine failure after takeoff. The pilot had attempted a downwind landing and missed all five arresting gear cables. Having just taxied to the throat and switched to tower, I saw him coming and thought, "What's he doing? Doesn't he or his copilot know it's the wrong direction? Of course they do; they were doing FCLPs in the opposite direction just a minute ago."

Anyway, like I said, they missed the gear, went by me at about 150 knots, and went straight down the hill toward the water. How the pilot did it, we don't know . . . but he did pull up. The aircraft did miss those ships in the harbor off the end of the runway. It did avoid those hills all around the field. And the crew lived to go booming that night like it was going out of style.

Why did this incident – that avoided being a tragedy by only feet – occur? Was it simply due to material failure of the engine? Was it pilot error for flying such a fast approach speed? Was it maintenance error? In truth, these were all elements, but two very critical contributing factors in this episode were less obvious: tunnel vision to complete a mission regardless of the risk; and departure from normally sound judgment due to immediate pressure. To understand how this unusual situation occurred, it is necessary to go back and review the background that set the stage for this near-disaster.

It had been a long, boring, 30-day transit. Originally scheduled to deploy somewhere else, the big push to end the war had sent us west. There had been no chance for flight ops during that month, but we had prepared for war with lots of training sessions in and out of the cockpit.

Our CO made the transit with us, instead of having the change of command prior to deployment. I guess he wanted one more time in the war zone. But CAG had fixed that. The change of command would be held in port prior to getting underway for Yankee Station. Once he was aware of that, the CO checked his stateroom for light leaks just about all the time.

The XO was ready. After all, he had waited years for this chance. A logical thinker, he had the ability to step away from a problem and be objective. The CO had a rather turbulent personality, and the XO had been like a rock . . . the steadying influence that the command had needed. If the mark of a leader is a large measure of patience and the ability to remain calm, then he had it. For example, when a starboard engine had failed during the previous cruise, it was he who stayed cool, devised an alternate method of lowering the landing gear, and brought his bird back aboard. He later told me that through that

experience he had found an extra reserve from which to draw. A good pilot, low-keyed, levelheaded individual, he was also very personable. Little did any of us guess that things would turn out the way they did that night.

Just before we pulled into port (we even had a port brief about *that town* by a most experienced gent – it popped the XO's eyeballs), CAG said, "It'd be a good idea if we got some FCLPs in before we leave the joint. You guys can have the first day." Nice guy, the CAG. The squadron really ate that up. The XO thought it was a good idea, too.

So we reached the tropical paradise of our dreams and briefed. As you might guess, no one was happy with the situation. What you wouldn't guess, is why:

a. It turned out to be a night launch.

b. No one had flown for over 30 days.

c. Weather that night was forecast to be low scuds and rain.

d. It was a strange airfield surrounded on three sides by mountains.

e. Winds dictated a right-hand pattern.

f. Everyone really wanted to go booming.

Having just about turned over command to the XO, the CO was somewhere else. During the brief, everyone there recommended a no-go to the XO – *and there he was* – about to make a decision that could keynote his tour. And he probably felt the CAG looking at him. We suited up.

The mishap aircraft was the first airplane to launch. After completion of about four FCLPs, the port engine failed at about 300 feet. A recent RAG graduate, the first-tour pilot had been behind the airplane most of the way. Ground effect saved him, and after he pulled up to avoid an island dead ahead of the runway, he continued to climb to about 1000 feet. He then set up for a downwind landing.

Unfortunately, the no-flap configuration and extra fast airspeed that he chose raised his tailhook high enough to miss all those wires. The next day, I found nose and mainmount tire tracks in the grass, running down the 20-foot slope. That no accident resulted was indeed a miracle.

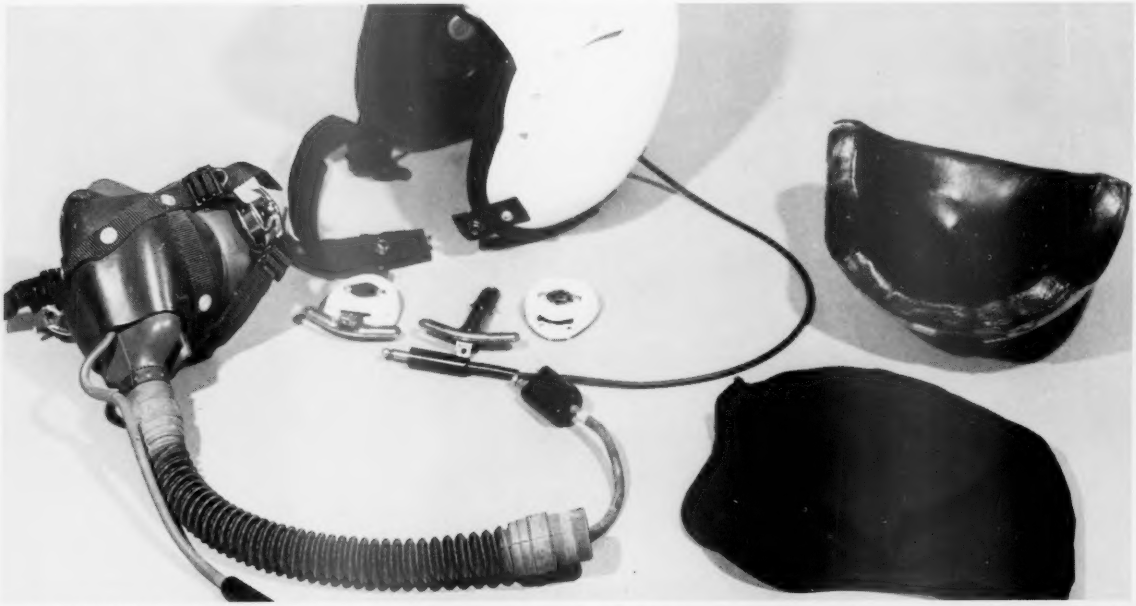
Me? I launched and flew a few passes until the scuds formed a ceiling at 400 feet or so. Unable to maintain VFR, I landed. The XO? Well, he got frenzied. He chomped at the bit. He asked the LSO why he had shut down. He asked me why I had shut down. He went to base ops. He went to the line shack. With a singleness of thought, he attempted to find a volunteer to go up with him.

Fortunately, NATOPS precludes a one-man crew, or *that night,* he would have gone. The XO – the logical thinker I told you about – he would have gone. And that's the only time I ever saw him like that.

If he can get that way, so can you.

"The flight gear people at Naval Parachute Test Range and NADC [Naval Air Development Center] are also guilty. They don't find out what the Fleet really wants . . . "[1]

" . . . I recommend that we take our 'experts' from Warminster, put them in that better CWU-33/P suit for 3 or 4 hours . . . "[2]



The HGU-33/P is a five-ply fiberglass helmet with a formfit liner and outside oxygen mask retention system. It will be the interim replacement for the APH-6 series until the HGU-35/P is authorized.

Flight gear problems:
NADC's point of view

By LT John A. Van Devender
Fleet Liaison Officer, Crew Systems Department
Naval Air Development Center

HELL hath no fury like a naval aviator with a flight gear problem.

Comments such as the above quoted, encountered with increasing regularity over the last few months and years, have prompted the establishment of a new billet at NADC called "Fleet Liaison Officer, Crew Systems Department." Its function is to provide Fleet inputs to crew equipment projects. In February 1977, I, an errant A-7 driver, hot from the Monterey P.G. school and in dire need of a payback tour, assumed the duties of this billet and hereby present my impressions of the status of the crew equipment problems alluded to in the above quoted articles.

There are problems with crew equipment that are desperately in need of correction. No one will contest that fact. However, the seeming consensus of opinion that NADC is either unfeeling or inept in its method of approaching these problems is both incorrect and unfair.

[1]"The Pilot's Dilemma," APPROACH, June 1977.
[2]"Our Readers Respond," APPROACH, February 1977.

The conscientious engineers who attempt to combine sophisticated and time-consuming RDT&E procedures with the unpredictable changes of small-scale projects, such as crew equipment, deserve to have their side of the case told occasionally and at least receive some respite from the continual criticism.

As a matter of fact, all of the equipment addressed in LCDR Stallings' article, "The Pilot's Dilemma," in the JUN '77 APPROACH is under some stage of development within NADC, along with a myriad of other programs. LCDR Stallings is perhaps unaware of these other programs since they apply to communities other than tactical air. His point, though, is well taken. The Fleet needs to be informed, and that is where I come into the picture.

Let us examine a few specifics:

Helmets. The problems with the APH-6 are so well documented that their restatement is unnecessary. The answers to the problems are not trivial, however, and require major efforts toward solution. NADC has two programs aimed at replacing the APH-6.

- HGU-33/P – A lightweight version of the APH-6 to be procured with formfit liners for interim replacement of the APH-6 helmet in use. It has completed extensive evaluation at ACEVAL/AIMVAL (air combat evaluation).

The HGU-35/P is the aircrew helmet of the future. It combines a low-profile oxygen mask with a rear entry oxygen hose.

- HGU-35/P – A quantum jump in helmet design that incorporates a rear helmet entry of oxygen hose and an integrated low-profile mask (above photo).

Currently, the progress of the two helmet programs is orderly with the Approval for Service Use (a requirement which must be met prior to large-scale procurements) of the HGU-33/P due in the October 1977 time frame. Large-scale procurements then depend upon contractual efforts scheduled for July 1978. Fleet introduction is due the following January. The performance of the HGU-33/P has received singular praise from the pilots actively engaged in ACM, and its comfort and performance are comparable to the Protection, Inc. model mentioned by LCDR Stallings.

The HGU-35/P is in a developmental state, and although it has completed limited testing in a VTAS configuration during the ACEVAL/AIMVAL program, it still requires full-scale operational evaluation. Due to its developmental nature, the HGU-35/P is still a few years away from Fleet issue, but it is moving at a pace consistent with good engineering efforts.

These helmets (HGU-33/P and HGU-35/P) are only part of the helmet programs at NADC. There are also helmet designs being pursued for flight deck and helicopter crewmen which address their specific needs.

Survival Vest (SV-2)/Torso Harness. The torso harness "per se" is not an item which NADC controls, although the integration of the SV-2 with the torso harness was accomplished at NADC. The modified torso harness incorporates a minimum of "unneeded paraphernalia" in pockets attached directly to the harness. NADC had this configuration in verification (a requirement prior to Fleet implementation) as of 30 June 1977. This modification is

This torso harness mod offers less bulkiness with pockets attached directly to the torso harness.

not applicable to *Harrier* pilots (we have to remember the Marines) or S-3 pilots at present since their communities use the diluter-demand regulators. Separate programs are underway for these communities, but these separate requirements serve to illustrate the nature of crew equipment difficulties.

G-Suits. New procurements of G-suits will have an improved lacing procedure and *Nomex* outer coverings. There was an attempt to eliminate the lacing altogether and use a *Velcro* fastener, but the *Velcro* failed to withstand repeated opening and closing.

Cold Weather Survival. Currently, the U.S. Navy has one approved cold weather suit, the CWU-33/P. It is a bulky, hot, ill-fitting garment, but it provides the best cold water exposure protection available.[3] NADC has been tasked to support the CWU-21/P *Ventile* dry suit and shall, to the best of its ability, do so. The problems with the CWU-21/P are also well documented. Current figures indicate that the CWU-21/P neck and wrist seals, as well as the rubber socks (required on the standard configuration), need replacement after an average time between 60 and 90 days of Navy usage. This particular suit and replacement parts, however, are items of Air Force supply, and lead times for procurement of the replacement parts are up to 15 months. The procurement of the suits themselves present other problems. The material is manufactured in England from imported Egyptian fibers, but the suit is constructed in the U.S. The resulting lead times for procurements of the suit can be as high as 24 months. What is the essence of all this supply gibberish? CWU-21/P suits will not be an item of supply for Fleet issuance before the winter of 1978 at the earliest![4] The logical question then follows: Why doesn't the Air Force have these problems? The answer is simply that the Air Force usage rate is much less than the Navy's, due to mission definition. The Navy's unique position of operating tactical aircraft over water for long periods of time creates a completely different logistic demand than the Air Force. The Royal Navy, contrary to popular belief, does not fly with single-layer *Ventile* suits such as the CWU-21/P. They use instead a double-layer suit.

A-13/A Oxygen Mask. The A-13/A oxygen mask is universally acknowledged as having numerous deficiencies. Currently, the mask slated to replace the A-13/A is the MBU-12/P, which combines lighter weight with a lower profile for increased visual capability. Engineering difficulties have been encountered with the mask, but it is presently undergoing OPEVAL at VX-4 and is estimated to be available through supply some time in early 1979.

[3]Testing conducted at Bamfield, Vancouver Is., B.C., Canada, of April 1977.

[4]Topic of discussion at ILS/AM panel meeting attended by all TYCOMS, held in Philadelphia, May 1977.

These efforts are only some of the more visible of the numerous projects actively being pursued at NADC's Crew Systems Department. There are efforts underway to add crash protection capability to helicopter crew stations, projects to increase the combat protection available to helicopter-transported troops, improvements to the LPA-2 life preserver, projects aimed at eliminating the need for liquid oxygen supplies (Onboard Oxygen Generating Systems), human factors engineering of new aircraft cockpits such as the F-18, and others.

Taking a closer look at some of the projects, one comes a bit closer to understanding the particular problems facing a crew equipment engineer. In the HGU-33/P and HGU-35/P examples cited earlier, a procedure for Approval for Service Use is being pursued. In the torso harness/SV-2 integration, there is not a universal configuration for all aircraft. In the CWU-21/P, there is a two-step procedure involving procurement of material followed by contracted manufacture of the suits. And the MBU-12/P, an Air Force item, must go through the Navy test and evaluation procedure prior to being incorporated into the Fleet supply system. Beneath all of these details lies one common thread: small-scale engineering efforts such as crew equipment are still required to comply with all of the RDT&E procedures which are designed for major weapon system acquisitions. Thus the paperwork and testing required of a new oxygen regulator is basically the same as for a new missile system. The end results of complying with the procedures imposed on crew equipment developments are costs which are somewhat out of proportion with the equipment generated, and time delays which slow replacement article progress to a snail's pace in all but emergency category items. Examples of the above statements are easily illustrated:

Costing effects – Although the modification to the torso harness for incorporation of survival vest items is in existence and the design is undergoing testing, it will require funding in excess of $40,000 prior to Fleet implementation. These funds are above and beyond the costs of development already expended and do not include the costs of procurements by the supply office.

Time delays – Since government agencies are committed to competitive bidding by policy, it is not uncommon for delays of 8-12 months to be imposed upon items for which development is virtually complete. An example of this is the HGU-35/P which is under contract negotiation for supply of OPEVAL quantities. Competitive bidding policies will result in a time delay of at least 18 months before the items are finally delivered:

- First month – Prepare a RFP (Request for Proposals) based on existing general specifications.
- Second month – Administrative lead time for

execution.

• Third and Fourth month – Contractors review specifications and submit initial proposals.

• Fifth month – Review of proposals and preparation of critique.

• Sixth month – Contractors review government critique and prepare resubmittal of "best and final" proposals.

• Seventh month – Government review of resubmittals and elimination of unacceptable proposals.

• Eighth and Ninth months – Solicitation of bids based on acceptable proposals, negotiations, and award of contract.

• Tenth through eighteenth months – Manufacturer initiates such actions as are necessary to begin production, submits sample items for quality assurance, and begins delivery of helmets.

Notice that the above time frame reflects ideal conditions for the limited acquisition of helmets for which a basic specification exists and limited testing has been accomplished. It doesn't allow for any communications delays, snags, or bureaucratic inefficiencies nor any other problems which could delay the contractor's performance such as labor or technical problems. This acquisition is only one step in the RDT&E cycle, and further such delays await after completion of OPEVAL. If the ideal condition is imposed further on the OPEVAL and approval is obtained after 6 months, then it can be readily seen that the inherent time delays associated with procurements alone will extend the date of introduction of Fleet quantities to a point at least 3 years beyond that detailed above.

One can imagine then the headaches which befall the engineer who is faced with both Fleet demands for improved equipment and inherent funding and time constraints imposed by a system which does not recognize the unique nature of crew equipment. All major weapon systems have CNO level program managers who ensure that adequate funding and support for their projects are available. Crew systems, which may span several weapons systems, have no comparable manager. For costly developments, it is often difficult to obtain the funding necessary to support projects due to this lack of high level commitment to crew equipment.

Funding is not the whole problem, however. Lack of adequate manpower is a factor also. It should be common knowledge that the hiring of civilian employees, including engineers, is at a standstill; yet the requirements for new developments increase steadily. It was interesting to note the editor's comment concerning URs and deficiency reports at the end of LCDR Stallings' article (1734 URs on aircrew survival equipment in the past 5 years; 243 URs on RSSKs, etc.). URs on aircrew survival equipment *and* RSSKs, as well as all beneficial suggestions, rigger tear sheet reports, and unanticipated requests from the Fleet for action are all part of the daily business accomplished by the same engineers responsible for the development of projects such as the above. The resulting level of activity sometimes verges on the frantic. And yet the URs are individually answered, Benny Suggs are investigated, and somehow the other work gets done. While an increase in funding could be very desirable, it would never solve the entire problem. Certainly the establishment of a PMA (Project Manager – Acquisitions) for crew equipment would go far toward streamlining the procedures presently required of the crew equipment engineer.

Hopefully this article has identified some of the problems facing the crew equipment engineer at NADC. The problems facing the Fleet aviator boil down to the dual and often conflicting requirements of safety and operational readiness. What can be done to resolve both sets of problems? The question is complex, and I am afraid the answer would be tedious. Let it suffice to say that the initial step is an improved level of communication between the Fleet operators and the RDT&E community. The Fleet Liaison Office is committed to that goal and readily offers its services. We want suggestions. We're happy to answer questions or provide presentations to Fleet units requesting them. We're as close as the phone (AV 441-2847). The Fleet can help by recognizing that NADC is directly responsible to sponsoring activities for its work output and direction. If problems confronting the Fleet were officially documented as statements of priorities from the type commands, then clear-cut goals and planning efforts could be established. An end result of Fleet emphasis of crew equipment could serve to focus command attention on the need for a PMA for crew equipment.

There are many salient points which could be the subject of controversy within the crew equipment category, and LCDR Stallings' cry for discourse concerning these subjects is both timely and necessary. As a pilot and an engineer, I can assure LCDR Stallings that the Fleet is being heard at Warminster, PA.

Criticism is what you get when you have everything else.

Ace L.

Anymouse

WHILE deployed on an LPH, the ship had civilians onboard to assist in routine maintenance. During flight operations, civilians were walking around and working on the flight deck without eyes, ears, or any flotation equipment.

A CH-46 landed on spot 2 and was being hot refueled. Downwind, a civilian crew with an acetylene torch was working on the No. 1 elevator (spot 3).

Any fuel dump by the CH-46 or an excess of fuel fumes could have sent the entire flight deck ablaze in seconds. This could have easily been prevented by proper supervision of the civilian workers.

Safetymouse

A Point About NATOPS

IT appears, unfortunately, that we all lose sight of something in the worship of the omnipotent NATOPS. That something is that it is written by frail man. Status gained by man is variable and even includes changing NATOPS.

Case in point. In 1974, there were voluminous changes to the P-3 NATOPS, including the addition of some new emergency procedures. In 1976, another change deleted some of the 1974 changes. I refuse to believe that we can't make up our minds on how best to operate an aircraft which has been around for about 16 years.

The only explanation I see is that due to the constant cycle of manpower, not everyone has yet resisted the temptation to reinvent the wheel.

In case my first example is too general, consider that in 1974, a change deleted the caution concerning the expenditure of an SSQ-36 with *Teflon* collar out of pressurized chute No. 4. Since the caution was deleted, VP-17/46 both have had similar incidents. While trying to expend the sonobuoys in flight, they became hung up in the chute. One aircraft was damaged. I guess that's why the original caution was printed.

I'm sure the Naval Safety Center has this information (from safety URs) in the data bank. One hopes that, armed with all sorts of empirical data, ridiculous changes to NATOPS won't be allowed. At least, we could save the expense of unnecessary changes to the manuals every year or two.

Ravemouse

Perseverance

ALL pilots and ODOs of my squadron have been briefed to notify me any time something unusual occurs or a hazard has been noticed. One night at supper, one of our pilots told me he had just landed and, while taxiing on the runway, saw an aircraft panel near the centerline. He had his crew chief pick it up and present it to the squadron ODO.

I went to the squadron, saw the panel, and recognized that it must be from a fixed-wing aircraft. It was gray, and most helo panels are green. I called the station ODO. A C-117 had taken off shortly before the panel was found, but after a call to his first point

The purpose of Anymouse (anonymous) Reports is to help prevent or overcome dangerous situations. They are submitted by Naval and Marine Corps aviation personnel who have had hazardous or unsafe aviation experiences. These reports need not be signed. Self-mailing forms for writing Anymouse Reports are available in readyrooms and line shacks. All reports are considered for appropriate action.

REPORT AN INCIDENT
PREVENT AN ACCIDENT

of landing, we were told his aircraft was not missing any panels.

Then I called the ODO of both fixed-wing squadrons aboard the base, and both called back shortly and said all their aircraft were secure. Just to be sure, all helo squadrons were also checked, with negative results. Convinced it was from some local aircraft, I got the station ASO involved.

The following morning, the station ASO personally took the panel to each fixed-wing outfit. He had no luck at the first one. However, a metalsmith at the second squadron recognized the panel as belonging to their type aircraft. They took a look at all of their birds, and none had any panels missing. A check of recent MAFs revealed that a replacement panel had been installed a week before on one aircraft. The crew was interviewed, and the mystery was solved. They had returned from an overwater flight and found a panel missing. They assumed the panel had come loose in flight and dropped into the ocean. They asked the metal shop to replace it, and all was forgotten.

Apparently, the panel had fallen off the aircraft into the weeds and grass along the runway, and, a week later, probably blown by the wind, it showed up on the runway. Pilots should report any missing panels and doors to their duty officer. A search should be conducted on base, until there is no doubt it isn't on the base, and isn't going to pop up to be a hazard to aircraft.

ASOmouse

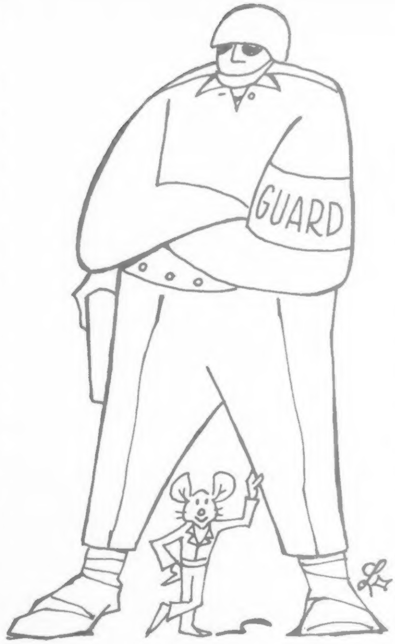
Close Call

OUR squadron was tasked to provide an aircraft for a static display during a recent celebration at a major airport. To ensure security, we locked the doors and installed pins in the gear and aux fuel tanks. We were assured the host would provide tight security.

However, when the gates were opened to the public, we were surprised that no barricades, ropes, or guards were posted to keep people away from the display aircraft. During the first day's opening, an aux fuel tank pin was pulled and the tank released. I suppose someone reached inside the wheelwell and pulled the manual release cable. The aux tank was full and could have crushed someone when it fell, or have ruptured and caused a fire.

For future static displays, I recommend adequate security be provided to guard aircraft and protect the public, too. Any time we're called on again, we'll ensure that squadron personnel will be onhand to watch the aircraft as well as answer any questions from the public.

Connedmouse



Carrier Problem

THIS isn't the first time the problem has arisen, and it is a problem which involves our safety. We're attached to a helicopter squadron aboard a carrier, and our helos are invariably spotted on spots 1 and 2, where they are subject to extreme jet blast.

The conditions are all bad. Visibility is limited because of eye irritation. When blades are unfolded on the SH-3, the walkers who tend blades 3 and 4 come within 20 feet of the jetwash from aircraft on the catapult. If the bladewalkers let the blades go, to stay out of the jet blast, the blade tips hit the deck. If the bladewalker enters the blast area, particularly when the deck is oily, it's almost impossible to maintain his footing. The A-7s give us the worst problems because they turn up for quite a while before launching.

Many suggestions have been made to improve the situation, but they fall on deaf ears. The situation is unsafe, and yet no one seems to care.

Helomouse

Goggles Not Used

AT our air station, we have a highly touted final inspection team concept. They are the FINAL checkers who must give an OK before an aircraft is allowed to take the duty. The problem is they consistently fail to wear goggles. (Only rarely have I seen anyone with goggles on.) They all have goggles – pushed back on top of their helmets!

The squadron ASO has been advised of the situation seven times, verbally and by memo. The tower has been advised by radio several times. No one cares.

I have a personal procedure which works for me. I don't let a member of the final inspection team anywhere near my aircraft until he puts on his goggles. They do so with obvious dislike and immediately remove them when I taxi out.

I'll admit the lenses are soft and scratch easily, but the cost of replacing them is a heap cheaper than an eye.

Frustratedmouse


Rader

HIGH ALTITUDE

Low performance

SINCE naval aviation is integrally involved with ships and the sea, most naval air stations are located close to water. This means, of course, good surf, sand, and sun. It also means near sea level altitudes for most flight operations. For those not used to operating turbojet aircraft at high altitudes, advance planning and extra awareness are mandatory.

A first tour JG had his initial experience with high-altitude ops, and apparently, he wasn't prepared for the dramatic performance degradation he encountered. A major aircraft accident was the result.

The flight was scheduled as an area fam/multimission hop on the first day of a weapons deployment to a high-altitude desert airfield. High-altitude ops were discussed in the brief, but takeoff distance was not computed. Following start, the pilot experienced ICS problems and swapped his mask and headset for the shop spare. This solved the ICS problem, but during taxi out for takeoff, the pilot discovered that he could not get oxygen flow. The crew returned to the line where the pilot and NFO swapped masks. Although this left the NFO with no oxygen, the crew decided to launch anyway and conduct the low-altitude segments of the mission.

Engine runup and afterburner checks just prior to roll were normal, and a MRT takeoff was commenced on the 14,000-foot runway. The pilot had decided to delay rotation until a higher-than-normal airspeed due to the high-density altitude (5660 feet) of the field. In his statement to the investigative board, the pilot stated that he rotated at 135 KIAS but felt no pitch response. He then realized that the stick was full aft. The pilot moved the stick forward and aft again. When this produced no pitch response, he decided to abort. The pilot stated that his airspeed at that time was 145 KIAS.

After the throttles were pulled back to IDLE, the aircraft started drifting to the right. The pilot countered with left rudder. The aircraft was shuddering, but he did not consider that the tires had blown. The NFO suspected this had happened, but did not relay this opinion to the pilot. At this point, the young aviator dropped the tailhook (3500 feet prior to the next arresting gear) and engaged the nosewheel steering. This caused the aircraft to start skidding to the right with the nose pointed left. The pilot, convinced that the aircraft would leave the runway regardless of what he did, called "Eject!" and reached for the face curtain. The NFO was aware of the directional control problems, but later stated he did not believe that they were *in extremis*. He was surprised to see the pilot reaching for the face curtain.

The pilot initiated command ejection. The sequence was successful, with both crewmembers landing about 250 feet away from the aircraft. The abandoned airplane left the runway with 6150 feet remaining, sustaining Charlie damage.

The investigative board conducted an exhaustive examination of the aircraft and suspected components in an attempt to uncover any malfunctions or failures. The engine, pitot static system, flight controls, brake system, pitch and roll computers, other electrical/electronic systems, and the hydraulics systems were all checked, with no discrepancies found.

The board also conducted a test to determine takeoff distance under conditions similar to the day of the accident. From these tests, the board concluded that 4200-4500 feet of runway were required to get airborne. Inspection of the runway following this mishap clearly revealed where the brakes had been locked and where the hook was lowered. Since the crew noticed no deceleration prior to the decision to abort, the brakes must have locked after the abort decision. The tire skid marks commenced 3700 feet from the start of the takeoff roll.

Given this information, the board concluded that the attempt to rotate and the decision to abort probably took place well below nosewheel liftoff speed. The board theorized that the disparity between crew statements and other evidence was due to a combination of misread or misinterpreted airspeed indications and the unexpected extent of performance degradation.

The misread or misinterpreted airspeed indication could have been caused by the Mach/airspeed index bug position. The pilot stated that he normally set the bug on the airspeed for rotation to takeoff attitude. Normally, that setting is 120 KIAS for takeoff at sea level. The pilot did

not set the bug for this flight, nor was he aware of where it was set. Examination of the cockpit following the crash revealed the bug set at 90 KIAS.

A second factor that could have explained the pilot's actions centers around the aircraft's slower than expected acceleration. Since true airspeed (ground speed) was higher for the same indicated airspeed, visual cues may have contributed to the crew's belief that the airspeed was higher than it actually was. Also, the pilot was used to taking off in A/B, but due to an engine restriction, only MRT was used. This, together with the increased density altitude, meant a 300 percent increase in required takeoff distance!

Whatever the reason for the pilot's actions, the board concluded that aircrew errors were factors in the accident. Specifically:

- The airspeed was not as high as the crew thought; neither the pilot nor the NFO properly read or interpreted the airspeed indicators correctly.
- Rotation to takeoff attitude was attempted too early.
- A takeoff abort was not required.
- Proper abort procedures were not used, resulting in blown tires and loss of aircraft control. The pilot did not extend the speed brakes, did not apply aft stick, dropped the hook well in excess of 1000 feet prior to the arresting gear, and commenced braking at too high a speed. He engaged nosewheel steering at too high a speed, leading to overcontrolled steering corrections and ultimately resulting in loss of aircraft control.

Adequacy of crew training and preparation for high-altitude operations was the subject of some disagreement among the various endorsers. The investigative board concluded that the pilot and NFO had received extensive and thorough training and thus were fully prepared for the mission they were about to undertake. For justification, they cited the following training that had been conducted prior to deployment:

- The squadron had held a safety scenario based on high-altitude field operations.
- As part of this scenario, the pilot had personally researched NATOPS for takeoff distance/liftoff airspeed and effects of missile loads on performance at high gross weight at high-density altitudes.
- The squadron conducted a safety lecture discussing field takeoff accident studies by NAVAIRLANT.
- A 4-day ground training program covering deployment flight operations was conducted the week prior to deployment.

Further investigation by subsequent endorsers revealed that the pilot may not have been as well prepared for his first high-altitude takeoff as this training would suggest. For instance, there was no evidence that anyone in the flight calculated a takeoff distance. Rather, the focus of the aircrew seemed to be directed toward airspeed instead of takeoff distance. There was an apparent misunderstanding by the aircrew (and possibly the squadron) on the effects of altitude on takeoff. The pilot stated that he " . . . decided to increase rotation speed by 15 KIAS to compensate for the higher altitude." However, altitude does not normally affect the indicated airspeed at which an airplane will rotate for takeoff. The time and distance necessary to achieve that indicated airspeed are the factors that are increased. The NATOPS manual for this type of aircraft has a chart that indicates up to 2 KIAS increase in rotation speed for pressure altitudes from zero to 4000 feet, but this is negligible compared with the 15 KIAS the pilot calculated.

In summary, it appears that this aircrew was not *really* ready for their first high-altitude takeoff. They did not expect the degree of degraded performance they encountered, and did not use all the available techniques and equipment at their disposal to assist in their takeoff. Had they done any or all of the following, the accident would probably not have happened:

- Computed density altitude for estimated takeoff time and then calculated takeoff roll distance. (The resulting 65 percent increase in MRT takeoff roll over sea level should have given the crew an indication of just how significant increased density altitude is.
- Computed a line speed check for 2000 feet of roll.
- Used the runway distance markers for a takeoff howgozit and distance remaining references if abort were necessary.
- Coordinated crew functions better. The NFO's inoperative oxygen flow may have impaired his ability to assist the pilot. The NFO should have been up hot-mike calling off airspeed at regular intervals and at rotation speed. He could also have assisted the pilot by keeping him informed on distance remaining.
- Set the airspeed bug to actual rotation airspeed.

Although the crew must shoulder most of the blame for this accident, they didn't receive much help from the flight leader. He also failed to compute and brief the required takeoff distance.

Low gross weight takeoffs, long runways, and high-performance modern aircraft operating mostly from sea level fields combine to make most takeoffs routine with plenty of performance margin. Therefore, most tactical aircrews probably do not plan takeoff distances or line speed checks under normal operating conditions. The problems occur when gross weight is increased, density altitude is raised, runway length is shortened, engine limitations exist, or a combination of the above occurs. These should be red flags for aircrews and should warrant breaking out the old blue book to compute takeoff information. Had the crew in this accident done that, it probably would have prevented a very avoidable accident.

Bravo Zulu

LT Larry Francisco
and
LTJG John Christensen

LTJG Christensen (left) and LT Francisco (right).

Here's all it was.

WHILE flying the NAS Key West US-2B on a routine run returning from NAS Jax to Homeplate, LT Larry Francisco, aircraft commander, and LTJG John Christensen, copilot, experienced a sudden nose pitchup of 40 degrees. They were flying at 5000 feet, 160 KIAS, and the autopilot was engaged. The plane commander immediately secured the autopilot and pushed the yoke full forward with no effect on the aircraft attitude.

An emergency was declared and normal trim was used to attempt to lower the nose without any luck. The attitude was still 40 degrees noseup. By using angle-of-bank and power changes, the *Stoof* was brought to a nosedown position. Suspecting a malfunctioning autopilot, LT Francisco pulled the autopilot manual release handle, but when the wings were leveled and emergency elevator trim was selected, the nose again pitched violently up.

The aircraft reached an extreme nosehigh attitude, about 80 degrees, and was ready to stall out. LT Francisco used his skill to avert a stall/spin by rolling the US-2 to a 120-degree angle-of-bank (7500 feet) to force the nose to fall through. After rolling back upright, the emergency trim system was sufficient to pull the aircraft level at 1700 feet.

Radar vectors were requested and received for a divert to McDill AFB (40 nm away) where a shortfield arrestment was made. Investigation revealed the failure of the elevator push-pull rod end assembly, which completely disconnected the flight controls from the elevator.

LT Francisco and LTJG Christensen exhibited rapid reflexes and sound judgment under trying circumstances and averted a tragedy. Well done!

THE flight was a cross-country, instrument training flight which consisted of many legs and a couple of RONs at different bases. The pilots were two qualified helicopter pilots with hundreds of hours in model.

The last leg on the second of 3 days was at night, and the crew was running behind time. They had had various delays and were anxious to get on with it. Their planning for the last leg was from Point Alpha to Point Bravo with a fuel stop en route. However, they found out that their intended fuel stop would not have fuel available at their scheduled arrival time. So they decided to refile in the air for an NAS.

Before they departed Point Alpha, they found a slight oil leak, and when ready to turn up, the APU began to malfunction. It's the same old story which has plagued pilots since the beginning of aviation. There's really nothing wrong with a system when a later investigation is made, but at the time, something (APU) won't work right. The HAC decided to start No. 2 on the battery. Number 2 engine fired normally, but when they switched to battery to start No. 1, they got a hot start. They shut down, and by then, the APU was repaired (connected/unconnected, repositioned, kicked) and was used to start No. 1.

Poststart and rotor engagement were normal, checklists were completed, and they departed. During climbout to 10,000 feet, both pilots forgot to raise the gear for about 3 minutes. They later noted an aux fuel light problem and began to worry about the fuel required to reach their destination. Three possible alternate landing sites were considered: one was rejected because it was closed; the second had only VHF communications, no contract fuel, and no useable navaids; the third was rejected for some of the same reasons as the second. Dual- and single-engine ranges were computed to the NAS, and both pilots concurred that they could make it.

They figured the fuel to NAS at 6000 feet, much lower

than they were flying. The HAC briefed the crew on single-engine procedures and emergency assignments. They requested an en route descent from 10,000 to 8000 feet and secured No. 2 to fly single engine at 95 knots the rest of the way. This would enable them to reach NAS with more than 200 pounds. Soon, they were cleared to descend to 6000 feet. Fuel consumption checks were made at periodic intervals, and they determined that they were saving a couple of hundred pounds of fuel per hour on single engine.

Center cleared them to NAS Approach just as the No. 1 engine emitted a loud, shrill whine. The HAC entered autorotation, the copilot broadcast a Mayday, No. 1 engine was secured, and the copilot tried to bring No. 2 back on the line. Several attempts were made to acquire normal start indications but were unsuccessful. Without telling the HAC, the copilot restarted No. 1 but heard the same loud whine. The engine and rotor RPM oversped, and flames were seen by everyone in the helicopter. The HAC controlled the overspeed with collective, and No. 1 engine was shut down again.

The HAC reentered autorotation and lowered the gear. Approach informed them there was a private airport directly ahead. The HAC saw the airfield and attempted to land, but was about 700 feet short. The helicopter touched down tail-first with zero ground speed and in a 20-degree flare. It pitched forward, sheared the port main gear, and rolled over onto the port side. Strike damage was incurred!

None of the crew was injured. As soon as the helicopter was secured, the pilots used PRC-90 radios from the wreckage and made contact with the airborne SAR helo from the NAS. In less than an hour after crashing, they were all picked up and taken to the nearby base.

The chain of events which culminated in this major accident had an identifiable cycle, which increased in severity each time they appeared. Consider:

• They were late in departing the first base where they had spent the night. Then they found out that their planned second fuel stop would be closed. However, instead of computing fuel available and changing their destination on the deck, they decided to do it in the air. Their decision to do this while airborne was indicative of their haste to reach that day's destination.

• It was determined later that two of the three airfield possibilities that they considered were OK to use. There were UHF frequencies available, and there was contract fuel at one of them. But in their haste to pick a base, they overlooked these important items.

• Reconstructing the flight profile, it was found that for the distance to NAS, their weight and internal fuel permitted them to reach NAS on dual engines with an adequate reserve.

• They violated NATOPS in excessive use of military power by flying an indicated airspeed in excess of the proper single-engine recommended airspeed (95 knots vice 90 knots).

• When attempts to restart No. 2 were abandoned, neither pilot remembered to turn on the flood/hoist lights, and neither pilot thought to jettison the aux fuel tanks.

• The pilots probably did not afford themselves proper rest and diet, which could have caused fatigue and mental errors under stress.

• Finally, they were victims of a malfunction in the No. 1 engine not related to the fuel problem. Had the pilots been flying dual engine when No. 1 started to fail, they could have continued safe flight on No. 2 and executed a safe single-engine landing.

A better approach to NATOPS checks

By Capt Alan P. Sullivan
VMAT-202 BN Training Officer

THE NATOPS program was instituted to reduce the astronomical pilot error accident rate of the fifties and to improve tactical efficiency by determining and standardizing the best procedures for operating aircraft. Since that time, the overall accident rate has been dramatically reduced, but aircrew error accidents have remained at a stable rate for the past 5 years. Perhaps the time has come to reevaluate the purpose and direction of the traditional NATOPS annual flight check.

As the NATOPS program is currently structured, annual flight checks for aircrews are conducted to assure adherence to standard operating procedures. However, NATOPS evaluators are specifically restricted from assessing tactical competency or flight techniques. In short, the NATOPS check ensures adherence to a minimum acceptable level of standardization, but does not necessarily ensure a satisfactory level of mission proficiency.

What is wrong with this concept of NATOPS evaluations? Several things. The average NATOPS check flight is conducted with less than 24 hours notice to the crew and is conducted by a fellow squadron member. It may be performed on any scheduled mission, including the easiest. Many NATOPS flight checks are conducted in not-fully-mission-capable aircraft on inappropriate missions by evaluators who are evaluating their close friends. These flights meet the letter of the law since the NATOPS program allows designation of an A-6 pilot, for example, as qualified with as few as 10 hours in type. This is valid as a "safe for solo" flight covering emergencies and basic airwork, but it is invalid when we look at the full spectrum of missions this aircrew could be assigned subsequent to his designation as qualified.

Several recent aircrew-factor accidents have been attributed, in part, to mission requirements that exceeded aircrew ability to safely perform those missions. Some examples are flight into water while bombing under flares, flight into mountains while working low levels at night, and departure/spin accidents in the ACM environment. Currently, no system exists to evaluate aircrew ability to perform specific missions. While we are still plagued by accidents resulting from deviations from standard procedures, it is time to expand the NATOPS program to include assessment of mission capability.

My approach to the problem would involve three elements. First, NATOPS flights would be limited to specific, operationally oriented sorties that would include some of the more demanding aspects of that aircraft's mission. For example, in the A-6, this might be a night terrain following route to a target, or for the A-4, a close air support mission. For an H-3, a suitable mission might be a night water personnel pickup. The objective is to ensure that the aircrew is genuinely capable of safely performing the most difficult missions that the aircraft may be assigned. What constitutes an appropriate mission would be specified in each NATOPS manual.

The second element of the proposal involves changing the scope and manner of grading NATOPS check flights. Currently, the NATOPS program does not evaluate weapons systems knowledge or technique. Further, all grades fall into three categories: Unqualified; Conditionally Qualified (the evaluee is safe for flight, but requires more work to meet the norm); and Qualified, which indicates a high degree of standardization. These rigid categories have major disadvantages. First, in the real world, not all aircrews are equally proficient. These generalized categories do not distinguish between the merely competent and the truly proficient. A grading system that permitted a wider range of grades would provide a clearer picture of true aircrew ability.

Partly due to the narrowness of the evaluation categories and partly because checks are performed by squadron personnel, very rarely is a grade other than "Qualified" assigned. This can be resolved through adoption of different grading criteria, as mentioned above, and through the use of a small group of NATOPS evaluators who are removed from the close-knit relationships evident in any squadron. This is

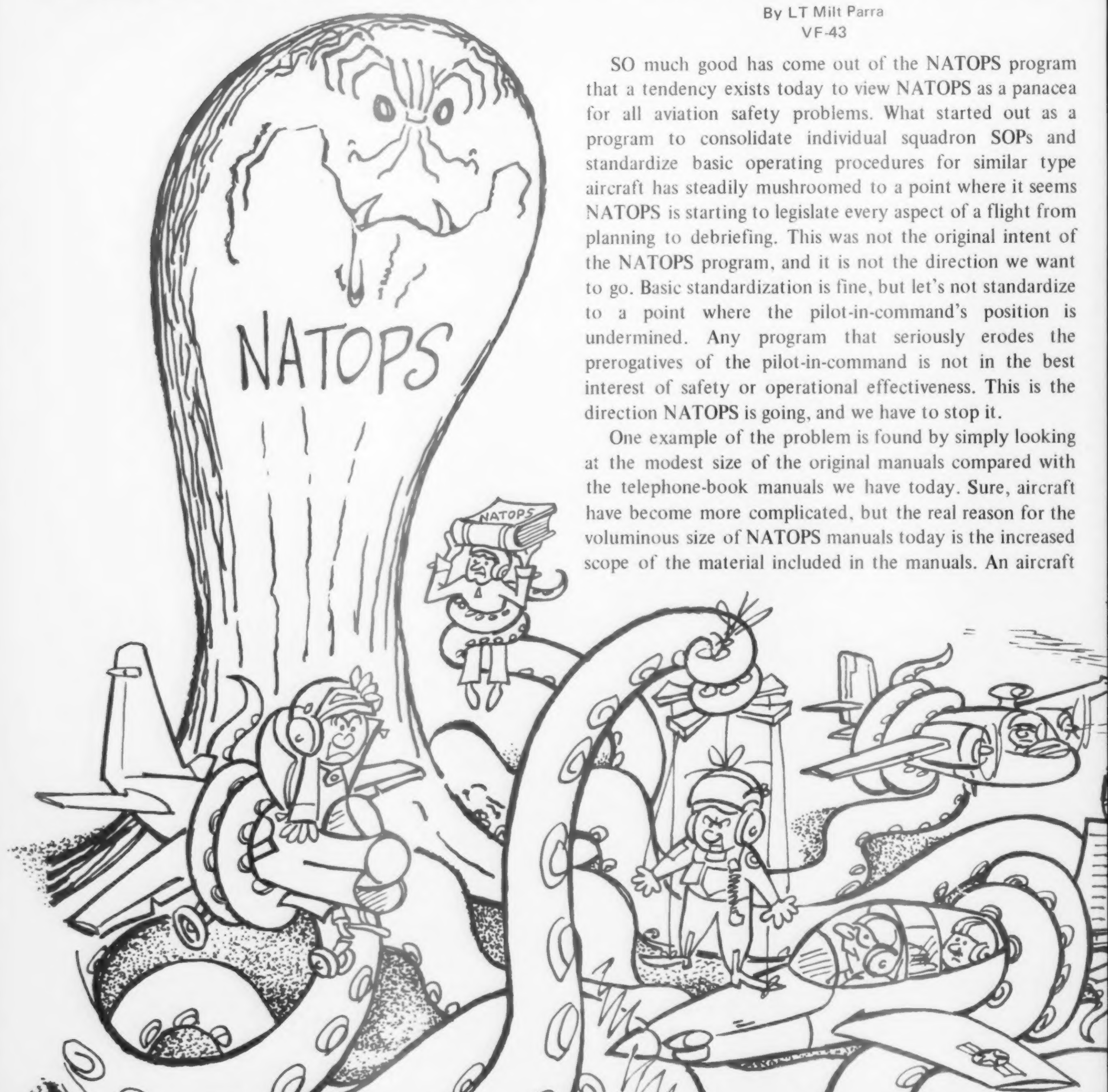
the third element of my proposal. These evaluators could be centered in the functional wing/group staff. Squadrons of similar aircraft have been centrally located for several years now in order to ease logistical problems. This arrangement lends itself to centralized evaluation of aircrews. External evaluation can standardize the level of minimum achievement within a particular community, better apprise commanding officers of the true strengths of their aircrews, and permit more objective evaluation of aircrews by removing the evaluator from the squadron environment. The squadron-conducted NATOPS evaluation would continue in those units that operate independently, or in mixed type aircraft commands, such as a deployed carrier air wing.

Opponents of this approach to NATOPS check flights will point out that many aircrews will not be able to pass this type of NATOPS check in the majority of aircraft after only 10 hours in model. They claim this would adversely affect training progress and instructor utilization. This is not really a problem, however. A solution already used by some training squadrons is to give an interim flight check (safe for solo) that permits certain types of operations that are well within the aircrew's ability while he undergoes further training in the aircraft. Some NATOPS manuals specify weather criteria for flight operations based upon total hours in model, even after the pilot is NATOPS qualified.

The NATOPS program has served Naval aviation with little change for nigh on 15 years. During that same period of time, we have moved from primarily a day, VFR tactical force to one that routinely operates IMC at night. Aircraft and weapons systems have grown increasingly complex and demanding. The conditions of modern warfare dictate that a pilot be capable of flying his aircraft while simultaneously engaging in a tactical exercise. Consequently, the real world focus of NATOPS flight checks must move away from nonchallenging, emergency procedures oriented "I'm OK, you're OK" flights to challenging, externally evaluated, mission oriented, meaningfully graded sorties. To do any less is to kid ourselves as to who is really qualified and who isn't. ◄

THE NATOPS OCTOPUS:

By LT Milt Parra
VF-43



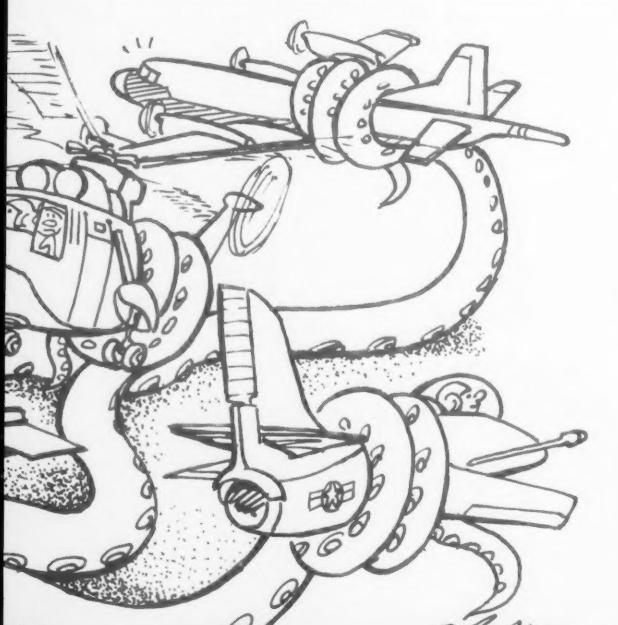
SO much good has come out of the NATOPS program that a tendency exists today to view NATOPS as a panacea for all aviation safety problems. What started out as a program to consolidate individual squadron SOPs and standardize basic operating procedures for similar type aircraft has steadily mushroomed to a point where it seems NATOPS is starting to legislate every aspect of a flight from planning to debriefing. This was not the original intent of the NATOPS program, and it is not the direction we want to go. Basic standardization is fine, but let's not standardize to a point where the pilot-in-command's position is undermined. Any program that seriously erodes the prerogatives of the pilot-in-command is not in the best interest of safety or operational effectiveness. This is the direction NATOPS is going, and we have to stop it.

One example of the problem is found by simply looking at the modest size of the original manuals compared with the telephone-book manuals we have today. Sure, aircraft have become more complicated, but the real reason for the voluminous size of NATOPS manuals today is the increased scope of the material included in the manuals. An aircraft

Let's stop its tentacles from growing before they strangle us!

accident almost invariably results in more verbiage for NATOPS. Either specific procedures are promulgated, telling pilots how to fly the particular maneuver involved in the accident or else a NATOPS change is recommended that altogether prohibits the maneuver. We are steadily moving toward a position where everything is spelled out and nothing is left to the pilot-in-command. At the rate we are going, we will probably reach a point someday where NATOPS will specify not to fly into a mountain! We have to rely on flight training to provide a basic level of airmanship and aeronautical knowledge, and limit NATOPS to standardizing procedures of a general nature for specific aircraft types.

To include operational evaluation as part of the NATOPS program would surely expand the already too large scope of NATOPS. Moreover, we cannot and should not attempt to tell every pilot how to fly every mission. Besides, it would be impossible. Squadrons on one coast may have completely different missions than similar type aircraft squadrons on the other coast. The Vietnam War years were perfect examples. A-7 squadrons from WESTPAC were dropping bombs and dodging SAMs while east coast *Corsairs* were engaged in surface ship surveillance, sea control, and nuclear low-level proficiency flights. How could a standardized evaluation of tactical efficiency be conducted under these varied situations?



Operational readiness is a squadron training function, and this is where it should be left. Pilot proficiency and ability to perform a given mission should be monitored by the CO, XO, ops officer, and flight officer. The pilot's training jacket should contain documentation of qualifications and mission capability. If a pilot is scheduled for a mission beyond his capability, then it is a training/supervision problem, not a NATOPS one.

While the "buddy influence" undoubtedly degrades the effectiveness of NATOPS checks, establishment of external NATOPS evaluators is not a perfect answer. The concept is not really new; the Air Force has been using it for years. However, unless the Navy adopted an independent stan-eval team such as the Air Force has (unlikely), the NATOPS evaluators would have to come from local wing/staff headquarters. Since they have many other administrative duties, a question of qualification arises. While experience certainly counts, currency is also important. Can a staff pilot flying 8 hours a month be as standardized and up to date as a line pilot flying 40 hours a month? In some cases, yes, but in other cases, no. NATOPS checks given by evaluators who are less qualified than those they evaluate are hardly an improvement over our present system.

Another problem with external evaluation was pointed out in the Navy/Air Force interview in the APR '77 APPROACH. The Air Force system of standardization and external evaluation severely limits the prerogatives of the pilot-in-command. This in turn jeopardizes flexibility and adversely affects a pilot's ability to react to unexpected or unusual circumstances in the air. Standardization is fine as a means to improve safety and conduct basic operations efficiently, but it is not an end in itself.

NATOPS certainly has its place, and there are some improvements that can be made without enlarging the scope of the program. NATOPS evaluators could be more hardnosed or evaluators could be limited to the CO and XO of the squadrons. A more expanded grading concept would better indicate levels of performance. But the basic concept of NATOPS – to ensure a high level of knowledge about aircraft emergency procedures, aircraft systems, and basic flight procedures – is fine as it was originally intended and does not need to be expanded. Nothing can ever be written that will take the place of good judgment, air sense, and aviation knowledge.

These articles represent opposite viewpoints on NATOPS. NAVSAFECEN does not necessarily endorse either opinion. Drop us a line with your opinion. – Ed.

The fighter pilot's breakfast*

As obsolete as the F-7

By LT G. R. Banta, MSC, USN
Naval Regional Medical Center
Meridian, MS

* Coke, candy bar, and a cigar.

WE in naval aviation are concerned with many aspects of human factors, i.e., fatigue, smoking, drinking, insufficient sleep, psychological areas, etc. All these things clearly affect our performance. One area often overlooked, however, is nutrition. And proper nutrition and diet are critical in a demanding occupation such as aviation. To a great extent, we are what we eat.

But how many of us give much attention to nutrition? How many times have you rolled out of bed before the cock crows, looked at your sleeping wife (beautiful in her curlers and cold cream), dressed, and headed for the base with great anticipation of a succulent readyroom breakfast of coffee and doughnuts. Ah, yes, many times. In fact, if you were to reflect back on your typical day's diet, you would probably not see a gourmet's delight: coffee and doughnuts for breakfast; a bologna sandwich or chili dog for lunch (if time permits, that is). Too often, even this modest lunch is supplanted by a nearby candy machine. At dinner, we usually try to make up for the day's shortage by consuming a week's worth of fried chicken, mashed potatoes, and a dozen beers or the like. What contempt we must have for our bodies to give it this for energy!

Nutrition oversees all our basic functions: heartbeat, nerve sensation, muscle contraction, etc. To obtain our maximum daily performance, we should have a working knowledge of the daily inputs and outputs of energy. An additional benefit of this knowledge is the food money which can be saved.

When selecting food, it is easier to classify the basic food groups according to their equivalent nutritional values. This allows us to interchange these foods within each group to add variety in our diet planning.

Essential Food Groups:

1. Breads: enriched or whole grain, cereal, or potatoes.
2. Citrus fruits, other fruits and vegetables.
3. Dark green or deep yellow vegetables.
4. Fats: butter, margarine, and other fat spreads.
5. Meat: fish, poultry, cheese, or eggs.
6. Milk.

The nutrient requirements for any given individual vary with his age and sex. Therefore, each individual's diet should be tailormade to that person's energy/output ratio, medical and physical condition, and it should be monitored continually.

When we think about diet and nutrition, the term "calorie" is used. The calories liberated after eating certain

foods represent the amount of energy released into the body as the food is broken down into various products. The average individual receives approximately 15 percent of his energy from proteins, 40 percent from fats, and 45 percent from carbohydrates, even though more energy per gram is available in fats. As described in "Blood Fat and the Fighter Pilot" (SEP '76 APPROACH), when a greater quantity of food (energy) is introduced into the body than is expended, body weight increases. In fact, for every 9.3 calories in excess of what is used, about one gram of fat is stored. The excess of energy storing occurs only when we are gaining weight.

To maintain a given weight, one only matches his energy output with his input. So, if you are one of those individuals who says, "I hardly eat a thing, and still I can't lose weight," your energy output is less than your input. You need to exercise more. BUPERS Instruction 6110.2B has established standard height and weight statistics for the Navy, but the instruction also states that such standards cannot be viewed as absolute for every individual. For example, an athlete may weigh more than allowable according to the table due to his high proportion of muscle tissue. Another individual may meet the standard weight, look trim, but still be in poor shape because of a high blood fat level and susceptibility to cardiovascular insufficiency.

If these exceptions do not apply to you, and your doctor (or CNO) decides you need to lose weight, what kind of diet should you go on? Many and varied diets exist – some with merit, some without. Whatever diet you decide on, it should meet the following guidelines:

- A diet must produce a negative caloric balance.
- A diet must contain a balance of required nutrients.
- The reducing program should produce a gradual weight loss (no more than 2 to 3 pounds a week). Medical monitoring is necessary for anything greater. Much of the weight loss on a semistarvation diet is quickly regained because it is not fatty tissue that is lost but muscle tissue or water.
- An exercise program should be a part of the reducing plan. Exercise helps build muscles at the expense of excess body fats.

One of the main problems of many fad diets that exist today is that they do not provide all the nutrients your body needs. *All* the food groups should be represented in a diet. A summary of the basic food groups and vitamins reveals why it is important that they be included in any diet.

Fats. Everyone needs some fats, but obesity and high blood fat levels are indicative of too much. In a daily diet, the amount of fat may hide itself. Fat doesn't dilute very easily, making it easy to store in the body, while carbohydrates and proteins mix readily into water

Below is a table of vitamins and minerals that should be included in everyone's diet. Eating a well balanced diet should provide all these elements.

VITAMIN/MINERAL	FUNCTION	SOURCE
Calcium	Builds and repairs bones/teeth; muscle and nerve functioning; blood coagulation.	Milk, milk products, dark green and leafy vegetables.
Iron	Forms cellular substance that carries oxygen to the body.	Liver, meats, egg yolks, peas, whole grain and enriched breads.
Vitamin A	Night and color vision.	Liver, eggs *, vegetables, milk, butter.
Vitamin C	Cellular function; wound healing; blood vessel strength; formation of bones and tissue.	Citrus fruits, tomatoes, strawberries, broccoli, green, leafy vegetables, potatoes.
Iodine	Formation of thyroid hormone for metabolism of food and oxygen.	Saltwater fish, iodized salt.
Vitamin K	Blood coagulation.	Bacteria in large intestine.
Vitamin E	Protection of needed fat stores.	Balanced diet.

* Vitamin A is not actually found in these products, but is produced from a provitamin (a substance used in forming the vitamin in the tissue) found in these foods.

Table 1

substances that can be metabolized quickly. A single pat of butter may contain more fat-storing potential than anything else on your plate.

Carbohydrates. This category of food provides an essential energy source for the nervous system (brain). Foods of this category include cereals, fruit, pastries, and other sweets. Choose carbohydrates in your nutritional plan wisely because they convert to stored fat very easily. Because of carbohydrates' high energy content, they are essential in preventing fatigue, especially when the body is under a considerable workload.

Proteins. Every cell in your body depends greatly on protein because protein plays an important role in the structure of the cells and enzymes that regulate body processes. Just as fats and carbohydrates, proteins are used for energy; therefore, you must constantly replace these proteins to maintain their functions in the cell. We normally acquire proteins from grain foods, milk, milk products, meat, poultry, fish, eggs, dried beans, peas, and nuts.

There are two types of proteins. *Complete,* which are found in animal foodstuffs, that can be broken down and used by our body properly, and *partial* proteins, which are normally found in vegetables and grain foods and cannot be completely used by our body. Therefore, to maintain a proper protein balance when partial proteins are the main source, the quantity must be increased. If you have the ambition to be a vegetarian, you may wish to bear this in mind. If you fail to maintain your proper protein diet, you may notice lethargy, depressed mentality, and in severe cases, swelling, especially of the abdomen.

The vitamins discussed in Table 1 are also needed in a diet. However, it is possible to get too much of a nutrient. Large amounts of vitamins A and D, for example, can be

Here's a balanced menu representing the six food groups: vegetables, fats, fruits, breads, meats, and milk. It is designed for an average healthy aviator weighing 150-165 pounds.

Breakfast		Calories
Orange juice	1 cup	80
Cornflakes	3/4 cup	68
Toast	2½ slices	170
Eggs *	2	146
Butter	1 tsp	45
Cream	1 oz	77
Milk	1 cup	170
Lunch		Calories
Cheese	1 oz	73
Butter	1 tsp	45
Roast beef	1 slice (3" x 2" x 1/8")	73
Bread	2 slices	136
Mayonnaise	1 tsp	
Celery and radishes	As desired	
Apple	1 small	40
Milk	1 cup	170
Dinner		Calories
Hamburger	2 patties (3" diameter, 1/4" thick)	146
Whole kernel corn	1/3 cup	68
Tomatoes	As desired	
Carrots	1/2 cup	36
Bread	2 slices	136
Butter	2 tsp	90
Plums	4 medium	80
Milk	1 cup	170

* NOTE: Recommended allowance of eggs is 3 per week due to high cholesterol.

Table 2

toxic, as can an excess of many minerals, such as iron. Higher amounts of other nutrients, though not toxic, may result in "condition deficiency." In other words, the body may adapt to increased amounts of the nutrient and experience deficiency symptoms when only normal amounts are consumed. A balanced diet will supply the proper amount of nutrients without supplements. Table 2 presents a sample diet that provides balance without excess calories.

The fallacy that everyone needs vitamin supplements (pills) to obtain sufficient vitamin intake is but one common misconception of the public. Other misconceptions abound. A discussion of nutrition would not be complete without shedding some light on these popular but erroneous beliefs.

- *The primary source of muscle energy is protein.*

If an individual is well nourished, protein is not the major source of energy. The amount of protein needed is determined by the individual's growth and increased muscle development.

- *Fats, fried foods, and oily dressings should never be eaten.*

The human body needs a certain amount of fat. The average American eats a diet that yields 40 percent of the calories from fat. In addition to the fat-soluble vitamins obtained from fats and the added taste they give to meals, fats keep you from feeling as hungry. On entering the intestinal tract, fat causes the release of a hormone "entergastrone," which slows down the emptying of the stomach to the digestive area of the intestine. Therefore, fat should not be eliminated from your diet, but it should be restricted as a preventive measure against obesity and coronary disease.

- *Since eggs are a good source of protein, you should eat a few each day.*

One quality protein food need not be emphasized over another. Eggs are digested well in any form, but because of current concern with cholesterol and coronary deficiency, you probably shouldn't eat more than three a week.

- *Combinations of some foods have special chemicals that burn calories faster.*

The grapefruit and egg diet does not burn off fat. No combination in food supplements assists the burning of calories.

- *Save your liquids until the meal is completed.*

It is not harmful to consume liquids during the meal. It *is* harmful to drink excessive amounts to wash down food without chewing it. Iced liquids should be drunk slowly to prevent interference with normal stomach and bowel functions during food consumption.

- *Crash dieting is quick and effective in reducing.*

You may lose weight with this diet, but you don't get the productive nutritive supplements necessary for proper health. Loss will occur not only in fat tissue but will include needed proteins and muscle tissue. In addition, the body, due to its slow adaptive methods, is apt to quickly regain the lost weight once the diet is removed. Sometimes, the dieter ends up with even more weight than when he started!

- *Snacks should never be eaten.*

Eating between meals is not necessarily bad if extra calories are needed to achieve daily caloric totals. In addition to providing energy, some snacks provide calcium, proteins, vitamins, and minerals which may be needed. But most snacks cannot be substituted for the six basic food groups needed in daily meals.

No article on nutrition would be complete without a discussion of that much debated question in naval aviation: Will you crash your airplane if you don't eat breakfast? Ever since flight school, aviators have had flight surgeons telling them the importance of eating breakfast. Several attempts have been made to correlate lack of breakfast with actual aircraft accidents.

While no conclusive evidence has been found to prove that lack of *Wheaties* causes accidents, a strong case can be built for eating breakfast. When you skip breakfast, fatigue and laxness hit late in the morning. The body tends to increase its fat stores after other meals to help compensate for the lack of energy during the hours of no food input. To be mentally and physically alert, you do need to eat some food early in the day to meet the body's caloric requirements. This doesn't mean you have to prepare a fancy breakfast with everything from juice to pancakes. A glass of orange juice, some milk, and an English muffin or toast with butter and jam will provide many of the food groups you need. In summary, something is better than nothing. But be careful of acquiring that dreaded aviator's habit – the "coffee – doughnut – readyroom" syndrome.

The benefits of good nutrition, along with proper body weight and cardiovascular conditioning, are a healthier, happier, and longer life. It can also make you a better and safer pilot. Your body is a precision, high-powered machine. Don't abuse it by giving it low octane food. ◄

Overweight is often just desserts.
Ace. L.

"You're well below glidepath"

" . . . going further below glidepath, if runway not in sight, execute a missed approach."

"Roger, runway in sight. I'm taking the gear."

But the aircraft never got that far. With the weather 200 feet obscured, 1/8 mile visibility in rain and fog, the aircraft touched down 475 feet short of the runway, resulting in ALFA damage. The pilot was able to egress without major injury.

This accident and the events leading up to it were, in many respects, similar to a typical annual instrument exam scenario. Although the pilot violated no rules as such, many interesting factors about instrument flying were brought up in the mishap. A tale like this vividly demonstrates why it's a good idea to stay awake and learn everything possible during the annual instrument ground school.

The accident flight originated as the second leg of an out-and-in to an Air Force base about 300 miles away from Homeplate. The pilot involved was scheduled to lead the two-plane flight back. Weather given during the brief was 300/1 for Homeplate and 800/2 for the alternate. Single-pilot minimums at Homeplate were 200/½. (The instrument exam at this point would ask: Could the pilot legally file with this weather? *Answer:* Yes. Forecast weather for destination was above single-pilot minimums for the ETA, plus or minus 1 hour, and the alternate was better than 300 and 3/4 above Homeplate TACAN minimums.)

The aircraft was fueled to allow a max-arrestment weight landing at Homeplate, with enough fuel left over to get to the filed alternate. *(Question:* What are the fuel requirements on an IFR flight? *Answer:* If an alternate is required, enough fuel will be onboard to fly from takeoff to the approach fix serving destination and thence to the alternate airfield plus a reserve of 10 percent planned fuel requirements but not less than 20 minutes flight time at max endurance at 10,000 feet for a fixed-wing jet.) Fueled and ready, the flight took off for Homeplate in the early afternoon. (*Question:* What minimums are required for a section takeoff? *Answer:* Circling minimums, or if no circling minimums are published, basic VFR requirements.)

The flight did not update weather with Metro enroute, and the first time they were informed that Homeplate weather was below minimums (300/¼) was after they had commenced an enroute descent. (*Question:* When, during an enroute descent, is the approach considered to have commenced? *Answer:* After leaving the altitude of the initial approach fix for the TACAN penetration in use.) The flight also discovered that their alternate had gone below minimums, as had the civil airport located in the vicinity of their homebase. A Navy base 120 miles away was reporting 800-1000 broken, so the flight selected this as their new alternate.

At this point, Homeplate weather improved to 300/½. Flight lead broke off his wingie to commence first, since he was lower on fuel, and lead proceeded toward the TACAN initial approach fix. The pilot's quick fuel computation revealed that he had enough fuel to shoot the approach and still proceed to the new alternate. This profile would put the aircraft in a minimum fuel condition.

The pilot was cleared for the approach and commenced. Shortly after this, Approach Control informed him that Homeplate weather had deteriorated to 300/¼ – below minimums! (*Question:* Can the pilot continue the approach? *Answer:* Yes, once the approach has been commenced, it can be continued to the appropriate landing minimum even if the field goes below minimums.) The pilot continued the approach, and upon handoff to Homeplate GCA, he inquired if his wingman had made it aboard. He was informed that his wingie had turned out at 10 miles and proceeded to his alternate.

Despite the (retrospectively) good decision of his wingie, the lead decided to continue with the GCA. He requested clearance and an unrestricted climb to his alternate in the event of a missed approach at Homeplate.

The GCA itself was consistently below glidepath. The only on-glidepath call was at 2½ miles. The final transmissions went as follows:

GCA: One mile from touchdown. You're slightly below glidepath, centerline very slightly right.

GCA: At decision height, below glidepath, use caution. You're well below glidepath! If runway not in sight, execute missed approach. You're well below glidepath.

Pilot: Roger, tally-ho on the field. I'm taking the gear.

(Question: Is a missed approach command by a GCA controller mandatory? ***Answer:*** It depends. If the runway environment is in sight when the missed approach is commanded, it is not mandatory. If the runway environment is not in sight, it is mandatory. If the controller says "tower directs missed approach," it is mandatory.)

The pilot stated that he did have the field in sight; specifically, the high-intensity lights and, shortly thereafter, the green threshold lights. The transition from instrument flight to visual flight was particularly difficult in this situation due to the decreased visibility and lack of depth perception caused by the fog and snow on the ground. The pilot's practice of not using the angle-of-attack indexers in his landing scan may also have added to the transition problems.

The pilot recognized he was low, and added power, but he was not aware of the magnitude of his dilemma. He did not go to MILITARY or retract the speed brakes. Only immediately prior to ground impact did he recognize the extreme danger he was in, and by then it was too late.

The cause of this accident must be attributed exclusively to the pilot. The investigative board found no aircraft malfunctions, or deficiencies in ATC, facilities, and supervisory functions. The pilot erred in the following ways:

- He failed to update destination and alternate weather en route.
- He commenced his en route descent prior to obtaining destination weather.
- He continued an approach with the weather below minimums and a minimum fuel condition existing in the event of a missed approach.
- He allowed the GCA approach to deteriorate beyond acceptable limits for existing conditions.
- He flew a consistently below glidepath approach to touchdown short of the runway.
- He did not adequately respond to the GCA controller's transmissions and the aircraft's low altitude warning system.
- He had a poor instrument scan transitioning from instruments to visual references.

The root cause of this accident can be traced to the pilot's decision to continue the approach, even though the field was below minimums. To shoot an approach to minimums is, in itself, not a bad decision, *assuming* pilot proficiency, currency, and experience are sufficient for this relatively demanding task. Also, enough fuel must exist to divert in the event of a missed approach. The pilot had a total of 1600 hours, and about 600 in model. His instrument time for the past 90 days was only 1.3 actual and 4.2 simulated. Moreover, as a member of a reserve component flying only single-seat aircraft, his opportunity to fly instruments on a regular basis and have access to the "bag" was far less than his active duty counterparts.

Therefore, it appears that while the pilot's decision was not illegal, it was unwise. While the prospect of a 120-mile divert to a strange field with fluctuating weather was certainly not attractive, it was definitely the "better part of valor."

An accident of this nature brings the contrived scenarios of the instrument ground school to a "real world" situation. Would this accident have been prevented had the pilot really been up to speed on instrument rules and regulations? Probably not. But consider the things he might have done to help himself out if he had gone by the book.

A Metro check enroute would have informed the pilot of the below minimum weather situation at Homeplate well in advance of his arrival. Perhaps the pilot would have chosen not to commence at all had he been aware of Homeplate weather and available alternates *before* he actually commenced his penetration.

More thorough flight planning in the form of bingo calculations to several different fields in the area may have taken some of the pressure off the pilot not to divert. A pilot is understandably reluctant to divert to a strange field over an unfamiliar route with unplanned fuel figures. Prior planning can avoid some of these factors.

The pilot indicated some unfamiliarity with instrument procedures. He had asked Approach Control if he could continue the approach after the field had gone below minimums. In a tight situation such as he was in, a thorough knowledge of all pertinent rules is important to stay on top of the situation and avoid getting behind the aircraft.

Interestingly, one of the recommendations stemming from the investigation was that the squadron detachment instructor checkpilots go through the annual instrument refresher course given to all active duty pilots. The goal of this recommendation was to bring the detachment reservists the latest rules and procedures in the instrument environment.

So, the next time your annual instrument course comes up, approach it with a positive attitude. Who knows, the next time you may really need some of the info being put out. ◄

Our Readers Respond

To disregard or *not* to disregard your gyro- That is the question

College Park, GA – Having spent many hours on "both sides of the radar scope" in no-gyro situations, I feel qualified to make a few observations concerning the fine art of starting and stopping all turns (see "Disregard Your Directional Gyro – Get Set Up for Trouble!" JUN '77 APPROACH).

First, it must be understood that the final controller gives heading instructions through judgments which are based on the displacement of the azimuth target from centerline, the distance from touchdown, observed track/speed, and the elapsed time since the previous heading was issued. The "no-gyro" method of heading control is the only alternative the controller has if the target track does not properly correlate to the heading instructions issued. I believe that this situation arises (in the order of probability) when:

a. The pilot responds slowly to heading changes and/or allows the aircraft to drift from the assigned heading. This most often occurs when gusty, rough air exists; however, poor technique and a slow scan can be the cause.

b. The controller is confused by the effect of crosswinds, variable wind direction, or wind shear situations. This most often occurs when the aircraft overshoots on the turn to final (for whatever reason) and must be corrected back *into* the crosswind. The controller gives two or three "normal" (i.e., no crosswind) heading corrections while the aircraft intercepts the glidepath and begins descent. Finally the controller gives a large heading correction at about the time the results of the previous corrections start to be observable – and at about the time the aircraft descends into more favorable winds – and the target shoots rapidly across the azimuth display due to the cumulative effects.

c. The controller misspeaks or the pilot misunderstands a transmission.

d. An actual error exists in the aircraft's heading indicator.

e. Various combinations of the above.

Experience, VFR practice, better technique, better understanding of one another's problems, etc. can reduce the number of times a, b, and c will occur. The point is, however, when the controller observes the target to track contrary to the instructions issued, he has *no other choice* except to switch to "no-gyro" procedures. And the pilot has no choice but to follow them.

The only problem in telling the final controller that your gyro is okay is, if you're in the soup, how can you really be sure?

Regardless of the pilot's familiarity with the airfield, I would not advocate combining a radar navaid procedure with a radar procedure except in an emergency. A no-gyro PAR approach is not an emergency; in fact, it should be quite a routine approach for both pilot and controller if practiced with any reasonable regularity.

I find no-gyro quite simple and effective, both as a final controller and as a pilot. Like everything else in aviation, it does require some degree of practice and proficiency. There's an old saying that "if you're not getting any, maybe you ain't tryin'."

LtCol Vic Steele, USMC

Dahlgren, VA – In response to APPROACH's request for comments regarding no-gyro approaches, I would like to relate the following incident. I was flying an EA-4F with VAQ-33 a few years back. I had an EWO (Electronics Warfare Officer) in training in the back seat. The aircraft had had previous gripes on the AJB-3 attitude gyro freezing in the GCA pattern. Maintenance was having real problems with this intermittent occurrence, replacing every possible

component of the gyro system.

Recovering at Cecil Field, FL, day IFR, a GCA was commenced at 20 miles and proceeded normally with aid being given to the EWO in proper GCA voice procedures and required responses. At 3 miles the controller came up in a very calm and normal manner and said, "Disregard your directional gyro." We had been in a shallow left-hand turn according to the standby gyro, and a successful no-gyro approach was executed down to landing.

Maintenance eventually found the trouble; when the doughnut light on the AOA indicator came on, there would be some electrical inductance getting into the gyro system, freezing the gyro. A wire was replaced, and the problem fixed.

The Cecil controller was good, and as LtCol D. E. "MOFAK" Cathcart states, "The no-gyro approach has its place, but before using it, let's make sure the gyro *really* has failed." I did. And the no-gyro approach *does* have its place.

LT H. C. Doumitt, Jr.

Norfolk, VA – As a previously qualified air traffic controller (GCA), flight instructor, and successful aviator (one that has not run out of airspeed, altitude, and/or ideas all at the same time) with over 4000 hours of accident-free flight hours in 21 years, I have experienced one other primary reason why controllers "take the pilot's gyro." That being, the reluctance of the pilot to react when so instructed by the controller. Be it intentional due to the pilot's "superiority complex," or unintentional due to "vertigo" or other reasons of misbelief, the fact is that the controller, after waiting a reasonable time, must assume that a mechanical failure has occurred, and he then must institute "emergency procedures." In order to preclude this, the pilot must fly his aircraft precisely and act upon instruction of the controller. Often is the time when the controller does not have the time to inquire of the pilot whether or not there is cockpit trouble, lest the rocks and trees reach up and smite him! The controller is basing "his" approach on the pilot flying "his" approach using standard or half-standard rate turns where applicable. So, the GCA is in fact a two-person (*sic*) approach, and to make it one with a safe ending, both parties must do their part in a professional manner.

Maj Joe "Toad" Homer, USMC (Ret.)

NAS Key West, FL – In the June issue of APPROACH, a very sad article was written. It was sad because a pilot with 23 years of flying experience and 6000 hours cannot trust someone who can save his life during IMC – the GCA controller. The article says in essence that when the controller "pulls" the pilot's gyro, the approach should be terminated by the pilot. A pilot not listening to the controller is one of the most dangerous things in aviation.

When a final controller "pulls" an aircraft's gyro, it's for one of two reasons. Either he wants to make a practice no-gyro approach, or he feels the headings issued to the aircraft to bring it on course are not being flown. If the first reason is the case, the controller should say, "Request you make this approach no-gyro for training." The pilot then has the option of going along with it or stating that he wants a normal approach. In no way is he forced to take a no-gyro approach.

The second reason, controller's judgment, is where the dispute lies. Any number of reasons could exist why the controller may want to make the approach a no-gyro. The headings issued are not being flown; the aircraft's gyro may be calibrated wrong; winds could be different through different portions of the approach; and so on. The important thing for that pilot to remember is that there is a person on the radar scope who is just as professional at his job as the pilot is at his.

LtCol Cathcart's statement that a no-gyro approach in instrument conditions almost always results in a missed approach is a little bit hard to believe. A no-gyro is actually an easier approach for both the pilot and controller if they both know their jobs. For the controller, it's easier because it is visual control all the way. With the aircraft making half-standard rate turns on final, he can stop the aircraft at any time instead of estimating the headings. And for the pilot, it is easier because he has to look at only one indicator – the turn indicator.

LtCol Cathcart's statement about shooting a nonradar approach while still under GCA radar control is not only unsafe, it could be a violation of the Federal Aviation Regulations. It's unsafe because the final approach course of the precision radar may vary considerably from that of the TACAN/ADF approach. It's also unsafe to use nonradar azimuth and the controller's glide slope, because nonradar azimuth is usually offset, and precision glide slope information is calibrated for straight-in approaches. Finally, an aircraft going down to decision height on the precision scope but actually shooting a nonradar approach with its higher minimums is in violation of FARs unless the airport is in sight.

Rule No. 1 in flying is: The pilot has final authority for the safe operation of the aircraft. But once the pilot states he wants instrument handling, it is both the pilot's and the controller's responsibility to execute that action in the safest and most efficient way possible. The system has to work correctly from both ends to function effectively. Disregarding your air controllers defeats the efforts of many professional men and women of the Navy and Marine air traffic control community.

AC3 Robert G. Cusano

Letters

Transmission Breaks on GCAs

NAS Lemoore, CA – I finally got a chance. In 1972, I drafted a letter to APPROACH Magazine, showed it to my Ops boss, and when he said, "Aw, forget it," I did.

Now it's time again. The JUN '77 issue of APPROACH had an article entitled "Disregard Your Directional Gyro – Get Set Up for Trouble!" It's a great article, but the interesting part was the editor's comments, " . . . Wouldn't it be feasible to inform the controller on a transmission break? . . . " Just when *is* there a transmission break during a GCA?

There isn't. It has caused problems for me and about 75 percent of the pilots I questioned for my unofficial survey at that time. My crumpled-up 1972 letter listed a few examples as I recall. One was trying to find out what a truck was doing on the runway, when I was three-fourths of a mile out. Unable to get through on GCA frequency, I switched to tower. Explanation: FOD truck. Second, in a "down to minimums approach," I tried to request the strobes. I made it, but they would have helped a lot. Third, at the 10-second gear warning, I lowered the wheels, one mainmount cycled slowly and then indicated unsafe. I tried to get a clearance to the holding pattern, but had to go through the whole approach to a missed approach before I could check out the unsafe gear. If you think I had problems, read "Good Heavens!", JUN '77 APPROACH. If there isn't an indication that procedures should be changed, then it will probably take a fatal accident to do it.

The editor's remark about a transmission break is invalid. The only transmission break you get is at 1500 feet straight and level, 6 to 10 miles out when everything is SOP. Six miles and closer is when the worms start filling up the bag.

I feel there is no reason to keep the GCA's mike keyed. It's out of date, causes confusion, is conducive to accidents, and just plain Delta Sierra!

LCDR Dennis W. Sniffin
Light Attack Wing 190
Naval Air Reserve Detachment

• The danger of continuously keying the mike on GCA final approach has been recognized for some time. As a matter of fact, this was identified as a factor in an Air Force accident. Something has been done about it, however. The ATC Handbook, 7110.65, para 1194, has a "Note" which states, "Controllers should not key the radio transmitter continuously during final approach to preclude lengthy transmission blocks."

While this is only a recommended procedure, informal liaison with Navy facilities in the Norfolk area reveals that they do, in fact, unkey the mike several times during a GCA final approach. If other Navy facilities do not follow this recommended procedure, they should certainly be made aware of it.

Nothing Is Free

Silver Springs, MD – LCDR Corkern has a valid point about the unforgivable delays in issuing a revised NATOPS ("NATOPS Change: A Three-Toed Sloth?", JUL '77 APPROACH). Three years between the gem of the idea and the printed page is too darned long to wait. Having been involved in the NATOPS tactical manual preparation business for the last 10 years, I can sympathize. Three years is the norm, and in some horrible cases, 4 years is more like it.

The problem arises from the unhappy interfacing of the civilian and military communities. A pilot's time is spent at the discretion of his commanding officer, and a civilian's time is spent according to how much money is available to perform a given task. The civilian usually works under the so-called NIF system (Naval Industrial Funding, or as we call it, "Nothing Is Free").

A book gets updated only if and when the dollars are there. And only a finite amount of dollars exist in any given aircraft program. Everybody has a valid claim on them . . . the NATOPS people, the contractors who turn out the MIMs manuals, the tactical manual community, and the people who are pushing for another ECP for an airframe update. The list could go on for a whole page!

NAVAIRSYSCOM doles out the dollars to support each of these programs according to its best understanding, and nobody is too happy with the results. Those dollars which finally do find their way into the publications support effort must support the salaries of an awful lot of cooks and bakers – the people who make the books appear "on the street." And because of the shortage of money, almost every activity is understaffed. Priorities result.

The machinations of the NIF system as it operates in the NATOPS/TACMAN area are unbelievable to the uninitiated. At any given time, there may be too much money for the A-6 program support and not enough for the F-4, and there may be none at all for the S-3. The size of the work, the urgency, the screams of the users who need the updated pub right away . . . these have little bearing on how many dollars the civilian side of the house may have.

There are good points to the NIF system.

APPROACH welcomes letters from its readers. All letters should be signed though names will be withheld on request. Address: APPROACH Editor, Naval Safety Center, NAS Norfolk, VA 23511. Views expressed are those of the writers and do not imply endorsement by the Naval Safety Center.

It does enable us to establish priorities and account for money. It allows certain programs to be developed according to the wishes of DOD and Congress at the expense of other programs. But here is the rub: Money is appropriated in DOD according to program, i.e., what hardware do we want to buy? And most publication software costs come out of someone's hardware procurement or maintenance program. Congress and DOD never appropriate money for publications. For this reason, there is no central management anywhere which can realistically look at the Fleet's needs for current pubs, respond to those needs, and get the book out without going back somehow to a hardware procurement desk.

And if airframe A has just undergone a major modification and airframe B is still the same old bird, guess which desk will have pub dollars available. Right – airframe B. And guess who *really* needs an update on their NATOPS. Right again. And woe to the misguided philanthropist who channels a few airframe B bucks over to the airframe A NATOPS or TACMAN program. Gross mismanagement of funds!

Even after money is appropriated for software for a given aircraft, there is still a multitude of people clamoring for their share . . . the technical support people at the field stations, the engineers who evaluate the changes, the technical editors at Navy Tactical Doctrine Activity, the printers, the layout people . . . all are funded directly or indirectly from hardware-oriented dollars.

Is there a good solution? Nothing short of a major overhaul of the way that dollars are routed in DOD – and that seems improbable even if it meant better NATOPS and TACMAN books. Other than that, we can keep the interim change system active . . . little short typewritten notes on Xerox, signed officially by the model manager or PRA and scotch-taped to the book. Scroungy as these things look, they still bear the full weight of officialdom. Let's keep those cards and letters coming.

Frank Pierce
Tactical Manual Coordinator
Surface Weapons Center, White Oak

Share the Article

Lock Haven, PA – When my boss (a Navy Reserve pilot) routed your April issue of APPROACH to me (an Air Force Reserve pilot), I chuckled, thinking it contained some humorous fuel for friendly interservice rivalry. He noted on the cover that the issue contained an "interesting comparison on Navy/Air Force Pilots."

After reading the article, however, it is my feeling that you should explore an exchange program with one of the Air Force publications so that writer Richard Shipman's excellent article is not limited to Navy eyes only.

The boss and I are both heavy equipment operators (P-3 and WC-135B), but agree the comments made by both of the fighter jocks are most informative.

Michael F. Murrell
Public Relations Manager
Piper Aircraft Corp.
(Captain, USAFR)

• **We're glad you found the article worthwhile, and we appreciate your kind remarks. As a matter of fact, *Combat Crew*, the safety magazine of the Strategic Air Command, is planning to run the interviews in two separate issues coming up shortly.**

Them's Powerful Wrong Words!

NAS Pensacola, FL – Great balls of fire! Your JUN '77 issue footnote to "Rolling (but not merrily) Along" really agitates me. Since the mid-fifties, various safety schools have attempted to enlighten aeroists that thrust and power are not synonymous and that neither equates to engine RPM percentage.

"I know you believe you understood what you think you said, but I am not sure you realize that what you said is not what you meant," i.e.:

a. 70 percent power – an indefinable term unless you provide some motion info.

b. 70 percent thrust – equates roughly to 90 percent RPM.

c. 70 percent RPM – equates roughly to 50 percent thrust.

I assume C is the proper technique you subscribe to; however, until we start saying what we mean, we are not being professional. As long as pilots equate power, thrust, and RPM, there will continue to be an inordinate number of landing and takeoff incidents.

CDR R. Carson
Naval Aviation Schools Command

Don't the Equipment People Listen?

NAS Meridian, MS – In LCDR Scott Stallings' article, "The Pilot's Dilemma," in the JUN '77 APPROACH, he noted the problems encountered with flight gear, and more notably, made some excellent common sense suggestions, particularly on the antiquated A-13 mask harness and APH-6 helmet.

If he says it's "unsat," don't the equipment people listen? A common sense observation is – who knows better about the gear than the man using it regularly? His specific gripes and suggestions should be as useful as any of the 1734 URs submitted. So why don't the equipment people act on it? The probable answer is that it is not on the UR form and properly channeled through the paper mill. It is strange logic when multimillion dollar pilots and aircraft use "nickel/dime" equipment that can (and does) have an immediate effect on pilots and aircraft. If LCDR Stallings says it's bad, this should be treated as a hi-pri statement that generates first line attention.

As for the URs themselves, why can't APPROACH run the essential UR gripe under a problems column as they come in, then list the corrective action or answer by the equipment people. I'm sure the aircrew community would appreciate the knowledge of both the complaint (UR) and response. Aside from that, the publicity generated would put the heat on the problem and the "fixers." This is especially true since the theme of the whole problem seems to be a lack of communication. Everybody reads APPROACH, and the aircrew might not have to wait 2 years for an answer. Also, everyone would have the same answer.

As for the "Rigger's Dilemma" – an excellent article with the title saying it all. The proposal suggested for the pilot's dilemma should make their life more bearable, too, for they can say to the frustrated aircrewman (at the very least), "See here, somebody is working on it."

All of this may be too much in the common sense realm to consider, but I thought it might be worthwhile to at least bring it up. Also, it seemed expedient to get it in while it still cost but 13 cents.

CmSgt Perry W. McGlynn, USAF (Ret.)

• **LT Van Devender's article, "Flight Gear Problems – NADC's Point of View," on pgs. 6-9 explains the problems that exist from "the equipment people's" side. As LT Van Devender points out, it's not that they are not listening, it's just that there are many problems in the "system" that preclude easy solution. As for the UR suggestion, it's not really APPROACH's function to get into this business, but we can certainly improve communications between the Fleet and the support activities. Articles such as LT Van Devender's and LCDR Stallings' are examples of how mutual problems can be aired.**

Vol. 23 No. 3

NAVAIR 00-75-510

approach

CONTENTS

DEPARTMENTS

Pg. 3

Pg. 18

Pg. 26

A Naval Safety Center Publication

Our product is safety, our process is education, and our profit is measured in the preservation of lives and equipment and increased mission readiness.

PURPOSES AND POLICIES/APPROACH presents the most accurate information currently available on the subject of aviation accident prevention. Contents should not be considered as regulations, orders, or directives and may not be construed as incriminating under Art. 31, UCMJ. Photographs used to illustrate articles in APPROACH do not necessarily reflect the actual aircraft, air stations, ships, and individuals that are described in the text.

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CREDITS/This month's cover depicting a T-2 *Buckeye* in the gunnery pattern was painted by Rockwell International artist Ronald D. Ferguson. Jet students receive their initial weapons training in the T-2 during the basic jet stage of their training.

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"Skipper, is there a ramp strike in your squadron's future?"

RAMP strikes are one of the unique hazards of naval aviation. Over the years, much attention has been given toward eliminating (or at least reducing) ramp strikes. Quantum improvements in ship facilities, equipment, size, and aircraft technology have lowered the ramp strike rate over the years, but they still occur. No carrier or carrier air wing is immune.

Interestingly, over the past 5 years, causal factors have been similar in about 90 percent of the cases. A statistical analysis for FY-72 through FY-77 reveals the following:

Total ramp strikes:	32 (includes hook strikes)
Night	25
Day	7

Ramp strikes by aircraft type:

F-4:	16	A-5:	2	E-2:	1
A-7:	8	S-3:	1	E-1:	1
F-14:	2	A-3:	1		

Pilot factors were far and away the leading cause, with 27 of the accidents attributed to pilot error as a primary cause. LSO factors and material failures followed with 4 and 1, respectively. LSOs were identified as a secondary cause factor in 10 of the accidents, while supervisory personnel and pilots were assigned secondary cause factors for 6 and 3 of the accidents, respectively.

A detailed analysis of the ramp strikes that resulted in major damage revealed typical profiles of the personnel involved. The pilot had little recent night experience, was fatigued, rough, and had the reputation as a "deck spotter" or a "No. 1 wire" pilot. The LSO was inexperienced, poorly supervised, had a tendency to "wait and see what happens," and was reluctant to give waveoffs. Supervisors failed to note problems of currency and permitted either the pilot or LSO to exceed his capabilities.

Skipper, do you have any pilots in your squadron like this? How about LSOs? As CO, are you aware of *your* responsibilities with regard to scheduling, pilot proficiency, and training? Ramp strikes can be prevented. Command supervision, pilot proficiency, and LSO ability are the keys. A constant review of these items is a mandatory part of your accident prevention program.

Adapted from a COMNAVAIRLANT message